COTTON

Volume 82
Number Three
Ten Cents a Copy

FEBRUARY, 1918

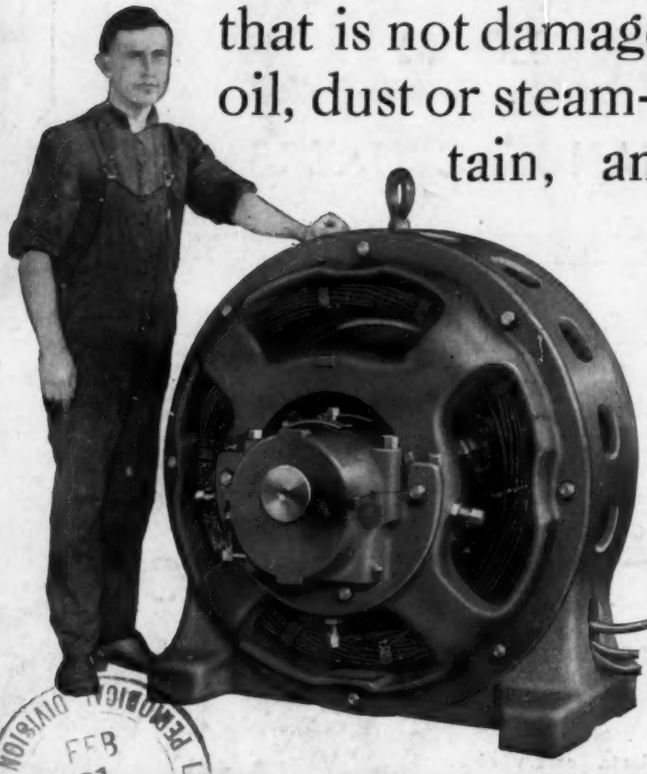
Published Monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

SIMPLICITY HONESTY

LINCOLN MOTORS

Trouble Proof

Are you interested in a motor that is not damaged by lint, water, oil, dust or steam--simple to maintain, and capable of handling heavy overloads?



If so, "Link up with Lincoln"

Write for Bulletin on Motors 101-N

The Lincoln Electric Co.

Cleveland, O. Charlotte, N. C.
New York City Chicago Philadelphia
Buffalo Columbus Toronto
Syracuse Detroit Montreal
Boston Pittsburgh

Agencies in Other Principal Cities.

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THE BEST NORTHROP LOOM

TRADE-MARK REGISTERED

BOBBINS

AND

SHUTTLES

ARE MADE BY THE

NORTHROP

LOOM

MANUFACTURERS

LOOK FOR OUR NAME
ON YOUR

Bobbins and Shuttles

DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

Southern Office
188 South Forsyth Street Atlanta Georgia

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FEB 19 1918

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor.

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 per year; Canada, $1.50 a year; Foreign, $2.00 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The names of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

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Volume 82. **Member Audit Bureau of Circulation.** **Number 4**

This Issue 5200 Copies.

SPECIALIZED MEDIUMS FOR SPECIALIZED THINGS.

It must be evident to any thinking man that the place to advertise commodities or appliances special to any given industry is in the publications that reach that industry and that such advertising, if well written, well displayed and persistently kept up, will not only effect the desired sales, but will build up a permanent good-will asset of inestimable value.

Whatever we do; whatever we manufacture, wherever we advertise we are turning out public opinion. If your advertising is placed in the journals that go to the particular industry you want to reach and these advertisements are well written, this public opinion will react upon your firm as good-will. Good-will is what we are all striving for.

Another thing to consider in using specialized mediums for specialized things—the advertising columns of trade, technical and class journals are read as a business duty by the men who subscribe to those papers.

WHY YOU SHOULD ADVERTISE NOW.

You perhaps realize that it takes fully as much time to bring an advertising campaign into full action as a military campaign. It is only problematical how much or how little time we have to sell the made-in-America idea to America and to the world at large.

However, we do know that we have right now all the resources necessary to make this country the most prosperous manufacturing nation in the world as soon as we are able to turn our capital and organizations loose on peace products.

Why should we hesitate to show our faith in the future of America by building now for that future?

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MEASURING DIRECT RETURNS.

Every advertiser is entitled to know what he is getting for his money.

Every publisher is anxious that his paper shall be credited with the returns which it produces.

Yet the fact of the business is that it is next to impossible to trace all of the results of advertising. Direct returns as a measure of the value of space are therefore inadequate.

This is indicated in a particularly convincing way by the experience of a well-known book publisher, whose business is handled entirely by mail, and is therefore altogether the product of advertising.

All ads published are keyed; direct advertising is likewise watched carefully, with special key numbers, so as to enable the publisher to note the percentage of returns from each piece of advertising sent out.

In spite of all this, however, the business which can be definitely attributed to specific forms of advertising is only about fifty per cent of the total.

In other words, at least half of the business cannot be credited at all, and yet without any question it is the result of advertising, because all of the busines of the house is secured in this way.

Most advertisers in other fields would probably be able to use a larger multiple, especially if they have salesmen and are following up their advertising in other ways, because in that event the situation is complicated by the opportunity for personal solicitation to interpose and take up the work where it was left off by the printed advertisement.

Consequently, when an advertiser says he didn't get results, an analysis of his business would probably demonstrate that results were secured, but were not credited to specific media.—*Class.*

"Saves ½ of Lubrication Costs"

says Chief Engineer Carter.

His cylinder oil used to cost 49 cents a gallon, but after adopting Dixon's Flake Graphite he found that a cheaper grade costing only 32 cents a gallon could be used.

The amount of oil was reduced from 50½ quarts to 27 quarts a week.

DIXON'S
Ticonderoga
Flake Graphite

greatly reduces friction in cylinders and valves, lengthens the life of packing rings, prevents scoring of valves and cylinders, reduces blowing, and effects a decided saving in fuel.

Write for Booklet No. 34-C describing the latest methods of feeding dry graphite into cylinders.

Made in JERSEY CITY, N. J., by the

JOSEPH DIXON CRUCIBLE CO.

D X N TRADE MARK — **ESTABLISHED 1827.** — D X N TRADE MARK

DRAWINGS OF YOUR PLANT

This is a Photo of Our Drawing of the Springstein Mills, Chester, S.C.

WE CAN MAKE A PICTURE LIKE THIS FROM THE ARCHITECTS BLUE PRINTS BEFORE PLANT IS ERECTED

RUDOLPH J. SHUTTING CO. CHATTANOOGA TENN.

JORDAN MANUFACTURING CO.,
BOBBIN MAKERS

Home Office and Plant No. 1
MONTICELLO, GEORGIA.

Hardinge "Alert"
Portable Watchman's Clocks

3	station	systems	complete	$38.75
6	"	"	"	42.50
9	"	"	"	46.25
12	"	"	"	50.00
16	"	"	"	55.00
24	"	"	"	65.00
33	"	"	"	75.00

Labeled by National Board of Fire Underwriters and approved by Factory Mutuals: Keys do not wear out: Guaranteed unreservedly: Shipped on approval: Prompt shipment: Service that *is* Service.

HARDINGE BROS., Inc. Established 1890

First and oldest Mfrs. of portable watch clocks in America

4176 Berteau Ave. Chicago.

GARLAND

The Highest Standard of Loom Harness Quality

Those who use our loom harnesses little realize how many harnesses fail to pass the rigid inspection which they are obliged to undergo. We criticize our own work more severely than it is criticized by anyone else and throw out harnesses which probably would not be criticized by the user. It is this policy which has given our harnesses a reputation for always being uniform in quality.

Let us tell you more about these Harnesses.

G TRADE MARK

GARLAND MFG. CO.
SACO, MAINE

FEB 19 1918
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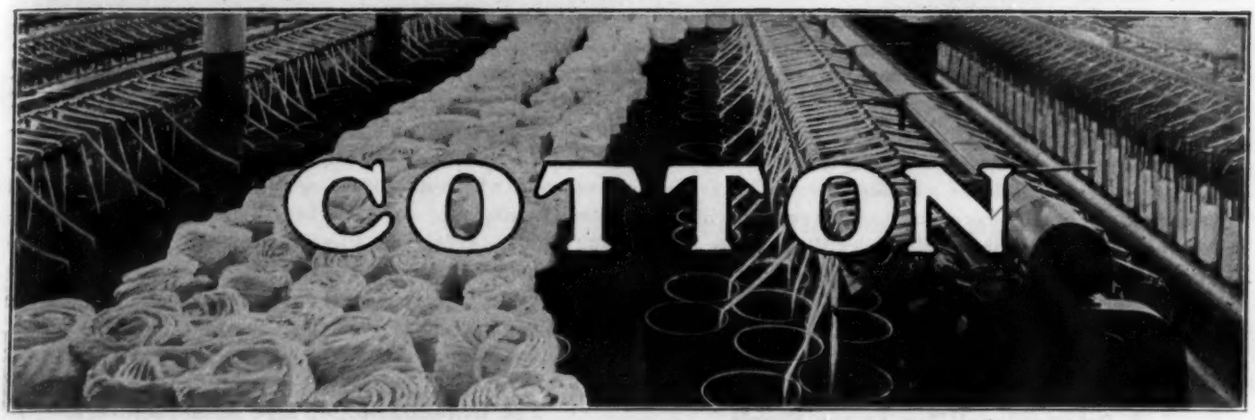


February, Nineteen-Eighteen.

The Reform in Hosiery Packing.

In asking for a reform in packing, primarily for the conservation of space in transportation, the Commercial Economy Board of the council of National Defense has presented to manufacturers of knit goods a most perplexing problem. The matter was brought to the attention of knitting manufacturers at a meeting of representatives of the industry in the Central West, held in Chicago, on December 7, in a letter from the Commercial Economy Board. In compliance with suggestions contained in the letter, P. C. Withers, presiding at the meeting, appointed a committee of three to conduct an investigation and submit a report.

Some manufacturers, it has been ascertained, have substituted paper envelopes for pasteboard boxes in packing stockings, and report that the change has effected an economy in both cost of packing and amount of space. A large hosiery mill in Illinois is using an expansion open end envelope with cord attachment as a container for one dozen mercerized half hose, size 10. The envelope is 13½ inches long and 4½ inches wide, and on the face bears the usual description of the hosiery. An executive of this mill believes a saving of space, labor and freight would be effected by a general substitution of envelopes for strawboard boxes, and has worked out an improvement on the container which his mill now is using.

The present envelope is of craft paper, glazed on one side, the best available for the purpose, according to a manufacturer of envelopes, but very scarce and practically off the market. A lighter weight paper of the same type has been submitted, but the manufacturer questions whether it would be sufficiently heavy, and doubts the adaptability of the paper container as a substitute for the strawboard box. Similar views are held by box makers.

In the first place, said one box maker, it is a question whether the trade would accept any form of packing less convenient than the box and lacking the facilities for displaying the contents to advantage. In his opinion the only solution of the packing question from the standpoint of economy of cost and space is in eliminating both boxes and envelopes for cheap stockings and tieing them securely in bundles, retaining the box for the medium to best grades of hosiery. Hosiery in bundles, it was pointed out, seldom arrives in good condition if shipped a long distance, and this is true particularly of consignments to South American ports. A hosiery manufacturer contends that, instead of cheapening the packing of articles for export it should be improved, and in support of this view cites the fact that his mill has established a large business chiefly through the use of attractive packing for articles of merit.

The paper envelope, so far as its use has progressed, is made in but few sizes, and in a majority of cases would be either too large or too small to conform to shipping room nicety. In children's socks, for illustration, there are nine sizes—eleven, according to some manufacturers. A Philadelphia hosiery manufacturer uses boxes of 300 sizes, for children's, misses', men's and women's hosiery. Envelopes in so great a variety of sizes, it is held, would cost almost as much as boxes, and unless adapted to size of contents, would not be acceptable to either mill or merchant. Knockdown or folding boxes have been suggested, but here again, there could be no material saving in cost. As the box commonly used is but an eighth of an inch greater in dimensions than the folded hosiery, there is doubt as to whether there could be any saving of space by the use of any other form of packing. The matter was thoroughly threshed out at the Chicago meeting, where there was manifested a desire to comply with the wishes of the Commercial Economy Board.

Since the Chicago meeting, Mr. Withers says, he has been doing some figuring and has ascertained that, based on the hosiery production in 1909, the substitution of paper envelopes, to carry one dozen pairs each, for strawboard boxes carrying a half dozen each, would effect a saving of 6875 freight cars and a saving of $9,000,000 in cost of packing for 1918.

The Spring Convention.

From April 29th to May 11th the Textile Exhibitors' Association will hold the big Textile Exposition in the Grand Central Palace at New York. The plans at present would seem to indicate that this will be the biggest and most complete Exposition ever put out by this organization.

Some time ago it was announced that the National Association of Cotton Manufacturers had arranged to hold their annual spring meeting in New York coincident with the

running of this show. However, no definite dates were given at that time. It now transpires that, insofar as is possible, the Annual Convention of the National Association is to be held in the form of joint sessions with American Cotton Manufacturers' Association, both meetings being held at the Hotel Biltmore in New York, and occupying all or part of the days of May 1st, 2nd and 3rd.

Naturally each organization will hold its own separate business sessions, but there will doubtless be many joint sessions also. Furthermore, the banquet which will close the joint convention will be held under the auspices of the National Council of Cotton Manufacturers.

It is anticipated that this will be one of the most successful Conventions and Expositions ever held by the textile industry.

A Congressional Tax on the People.

The curiously illogical plea advanced by the members of Congress who proposed and jammed through the 50 to 900 per cent postage increase on newspapers and periodicals is worthy of the quaint thinking of Sancho Panza himself. The former postal rates on periodicals, they say, was a "subsidy"—low postal rates in general they regard as a "subsidy" and openly so state. It would seem all but useless to ask men with minds so befuddled what our government functions and social and economic relations really are in the light of such mental incapacity.

Low periodical postage is not a "subsidy" from the Postal Department in any other sense than is the Department of Agriculture, with its enormous benefit to the nation, a "subsidy" to farmers; the Department of Commerce, with its vast information by which wealth and trade is added to our country, a "subsidy" to merchants and manufacturers; or the Department of Labor a "subsidy" to children when it opposes child labor, or a "subsidy" to workers when it bulletins throughout the nation opportunities for employment. There are certain great national functions in any society that are crystallized to such an extent, that they can be regarded as expressing civilization.

The history and development of the Post Office Department clearly shows that it was established, developed and extended in response to a need of the people of this nation, and which they demanded. It was founded and established as a governmental function in order to assist in spreading education, the knowledge of science, information and news of current history, to impress and make easy the ways of intellectual intercourse. Postage was provided at a flat rate, irrespective of distances or the cost of transporting the greater distances, *in order that American citizens in remote sections of the country, and who needed this mental and intellectual contact with their fellow citizens, should not be left to rust owing to the penalty of postal costs. This was and is the basic principle of postal service.*

But Chairman Claude Kitchin of the Ways and Means Committee thinks otherwise. So does Congressman Rainey of Illinois, and various other gentlemen of similar minds, who would place a penalty on reading in the remoter sections of the country and allow poverty to prohibit reading altogether. The "subsidy" of low postage is—to use the word in which these short-sighted political gentlemen so delight—to readers; it is a "subsidy" to the poor man's education; it is a "subsidy" to health, morality, intelligence and high thinking; it is a "subsidy" to culture, art and literature; and, to be brief, it is a "subsidy" to the highest development of American citizenship.

The national periodicals are printed in the big cities—and the first zone, the cheapest zone, is in or near those cities. Small towns and distant cities support many readers of national periodicals and this law increasing postage penalizes such periodical readers and shuts off educational opportunity where it is most needed and desired. It would seem that some congressmen have a desire to limit the reading public to *franked* speeches reprinted from the *Congressional Record.*

Interested readers should take this opportunity to write to their congressman requesting the repeal of this unjust tax on an intelligent people.

The Organization of Dye Manufacturers.

Prior to 1915 there were hardly half a dozen dyestuff manufacturing plants in the United States, facing the bitter competition of the German dyestuff export monopoly. The war cut off German exports, and in the three years interval some 200 manufacturers of dyestuffs and other products distilled from coal tar have established plants, representing an invested capital in excess of $200,000,000. The German dyestuffs had been scientifically standardized, so that the same results in dyeing were practically certain when standard dyes were used in the standard methods. The American dyestuff trade is still disorganized, individual manufacturers having their own color standards, with consequent confusion, litigation, and loss.

H. Gardner McKerrow, who took the initiative in calling the first convention of the industry, arranged for addresses by chemical and legal experts on color standards, arbitration, use of German patents, etc., subjects which dye makers are most concerned.

One of the compelling reasons for calling a convention of dye manufacturers and dealers was to cement the patriotism of the industry in a unifying force. Distillation of coal tar to produce dyestuffs is closely related to the production of the elements of high explosives and those who initiated the movement for a convention look to the closest cooperation with the government so that the United States, in times of peace, will have a great, prosperous, competition-defying chemical and dyestuffs industry, and in time of war, numberless plants which can distill the essential elements for high explosives with but comparatively trifling plant changes.

Prior to 1915 the world famous dye producers had their branch houses in this country. With the tremendous development of an American dyestuff industry the trade heard rumors of foreign influences that were seeking to retard production at American dye plants and to keep the industry in a chaotic state, without color standards, without testing standards, without accepted contractual forms and nomenclature. The object of this unprogressive sentiment within the trade, it was said, was to keep American dye manufacturers unmobilized, unorganized, and disintegrated, so that with the coming of peace the efficiently united foreign dye producers, acting in concert, would be able to drive against the new industry, demoralize the trade, and regain monopoly control of the business of supplying dyes to America.

These rumors were resented by American dye manufacturers and factors, but they found it useless to attempt to trace them to their source. Then began the talk of holding a trade convention and forming a central trade headquarters which would act as an educational and informational clearing house for the industry. This headquarters, it is expected, is to speak for the trade and its pronouncements will be accepted as those of a patriotic business group, intensely loyal to the United States. Through such headquarters, the trade will be always mobilized for the national good and the national service.

The result was the meeting in New York on January 22 and 23, when the Dyestuffs Association of America was formed. A further account of this meeting will be found elsewhere in this number of COTTON.

The Pink Boll-Worm.

This worm (*Gelechia Gossypiella*) Order of *Lepidoptera* (Butterflies & Moths) has been under observation in Egypt for about two years yet it is an established fact that it has been present in their cotton fields for some years prior to that time, taking an active part in the destruction of the cotton bolls. The reason that it has been confounded with the other boll-worm *(Earias Insulana)* is that both worms have, more or less, the same method of attacking the cotton plant, i.e. they both attack the boll, and the season of their attack is also the same.

The life history of this worm, although not yet thoroughly studied, differs much from the common boll-worm. The number of generations is not ascertained as yet, but it seems that we have at least two generations during the period of fructification of the cotton plant. The main difference between the habits of the two insects, and the one most directly concerning agriculturists is that the larvae of the pink boll-worm, instead of going to pupate, as in the case of the common Egyptian boll-worm, on the dry cotton sticks, waste lands, canal banks, etc. has the habit of hibernating *inside* the cotton seed itself in the form of larvae (worm). This peculiarity will, it is hoped, give the means of fighting the pest efficaceously, by treating all the cotton seed, before it leaves the ginning factories, with a special poisonous vapor to kill all the larvae found in the seeds.

Great numbers of these worms have been found inside the seeds during the ginning process. A case is reported where the street and the adjoining waste land outside the ginning factory at Kaft-el-Zayet, were covered with millions of these worms which had escaped from the cotton seed stored up in sacks in the Zarbiah of the factory. Very many cultivators have bought the very best cotton seed for sowing purposes and found the worm in the seeds.

It is now ascertained that the pink boll-worm is capable of living in the form of larvae, inside the cotton seed, for many months in a semi-dormant state without taking any nutriment. Also the dried cotton sticks, which are preserved in Egypt throughout the year for fuel, bear numerous dried and diseased bolls and afford ample protection for the moth and larvae. The insect has also been found occasionally feeding on till. The insect has increased much in numbers the last few years.

The remedy to adopt must be one of general application. From the preceding there is little doubt that treating the seed will prove a very good means of checking the pest. Burning the cotton sticks on a general scale will also be very necessary.

The foregoing facts, which were furnished by The Alexandria Cotton Co., Ltd., 40 Central Street, Boston, are of peculiar interest at this time, when the pink worm seems to be causing considerable trouble in certain sections of Texas.

New Crop of Madras Indigo.

A crop report of the Madras Department of Agriculture, just issued, states that the area under indigo in the Madras Presidency in the 1917-18 season is now estimated at 265,700 acres as compared with an estimate of 335,000 acres made at the corresponding date last year. The decrease is due partly to failure of rains at the sowing season in the Deccan, but mainly to the fall in the local price of indigo, dating from January, 1917. This fall did not affect the sowings in the southern districts, which take place normally in December-January.

An estimate of outturn at this stage is difficult, as much depends on the proportion of the crop that will be actually used for making dye. At least a third of last year's crop remains unexported owing to freight difficulties, so that the local demand for dye is poor, and in these circumstances some of the crop may be used for green manure. The report says that about 1,700 tons of dye can be manufactured from this year's crop, but that it is unlikely that more than 1,200 tons will be made.

In southern Madras both the green and the dry leaf processes of manufacturing indigo are followed; in the northern parts indigo is extracted only from the green leaf. Dry-leaf indigo is not exported; and, in general, the poorer qualities of Madras indigoes are used in the country and only the better one sent abroad.

It is said that perhaps the best average of indigo in southern India are produced in the districts adjacent to Madras. They are characterized by low specific gravity, bright color, and high indigotin content, and are generally comparatively free from adulteration. The season extends from August to January.

From the northern districts the qualities are somewhat variable, especially in Kurnool and Cuddapah, where some of the best grades are available, but where also a lot of inferior product is marketed. The cakes are graded according to size and quality, and deliveries later on in the season are generally superior to those marketed earlier. The season extends from July to February.

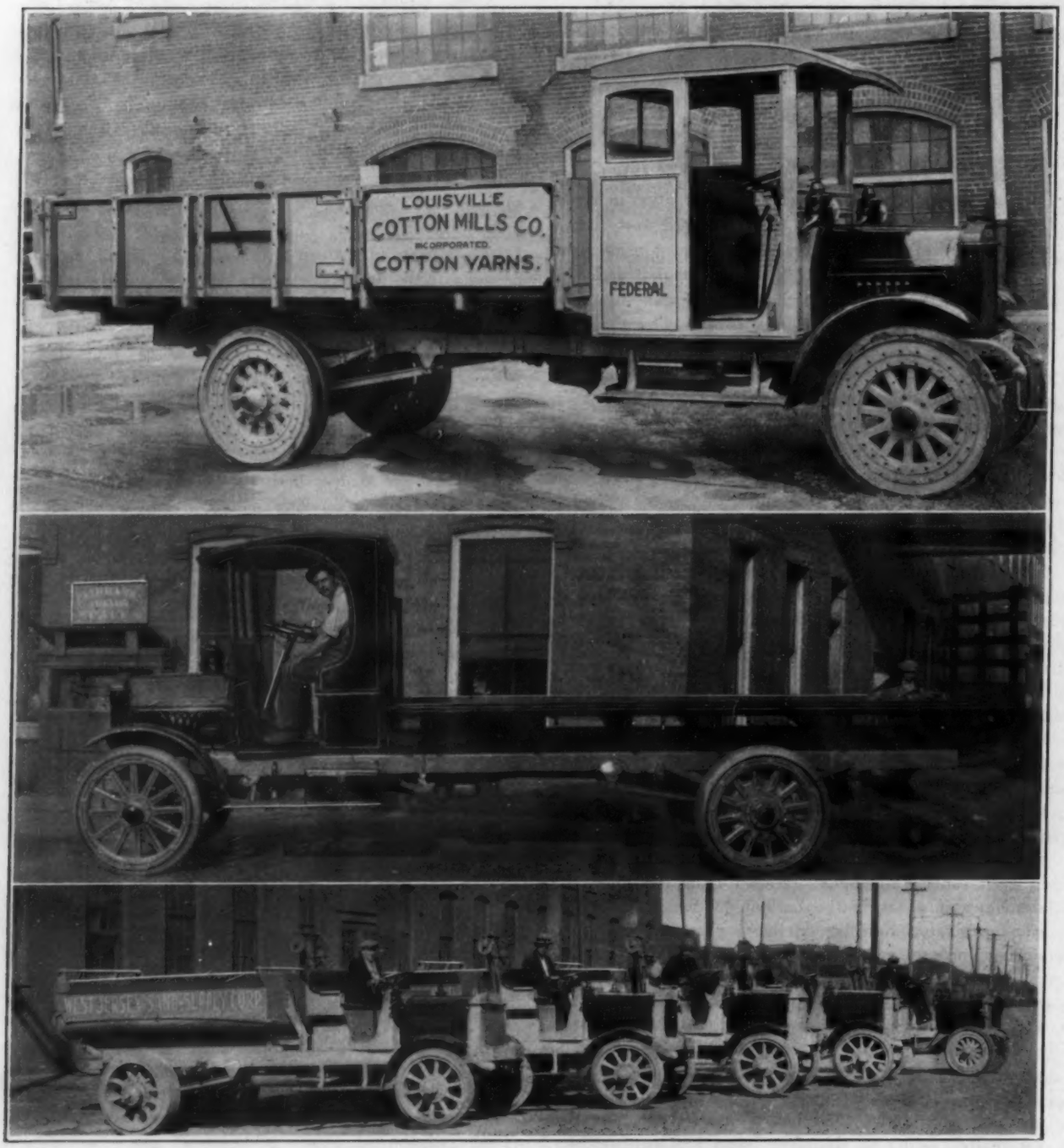
Experiments have been made by the United States Bureau of Standards to develop a method for accelerating the hardening of concrete, in order that the material might be used in revetment work in place of the willow mats that have been used in the past along the Mississippi River. The Bureau finds that 4 per cent of calcium chloride added to the mixing water increases the strength of the concrete at the age of one day 100 per cent or more. In some cases the strength of the concrete in which the calcium chloride was used at the age of two days equaled 75 per cent or more of the strength normally attained in one month.

Solving Transportation Problems

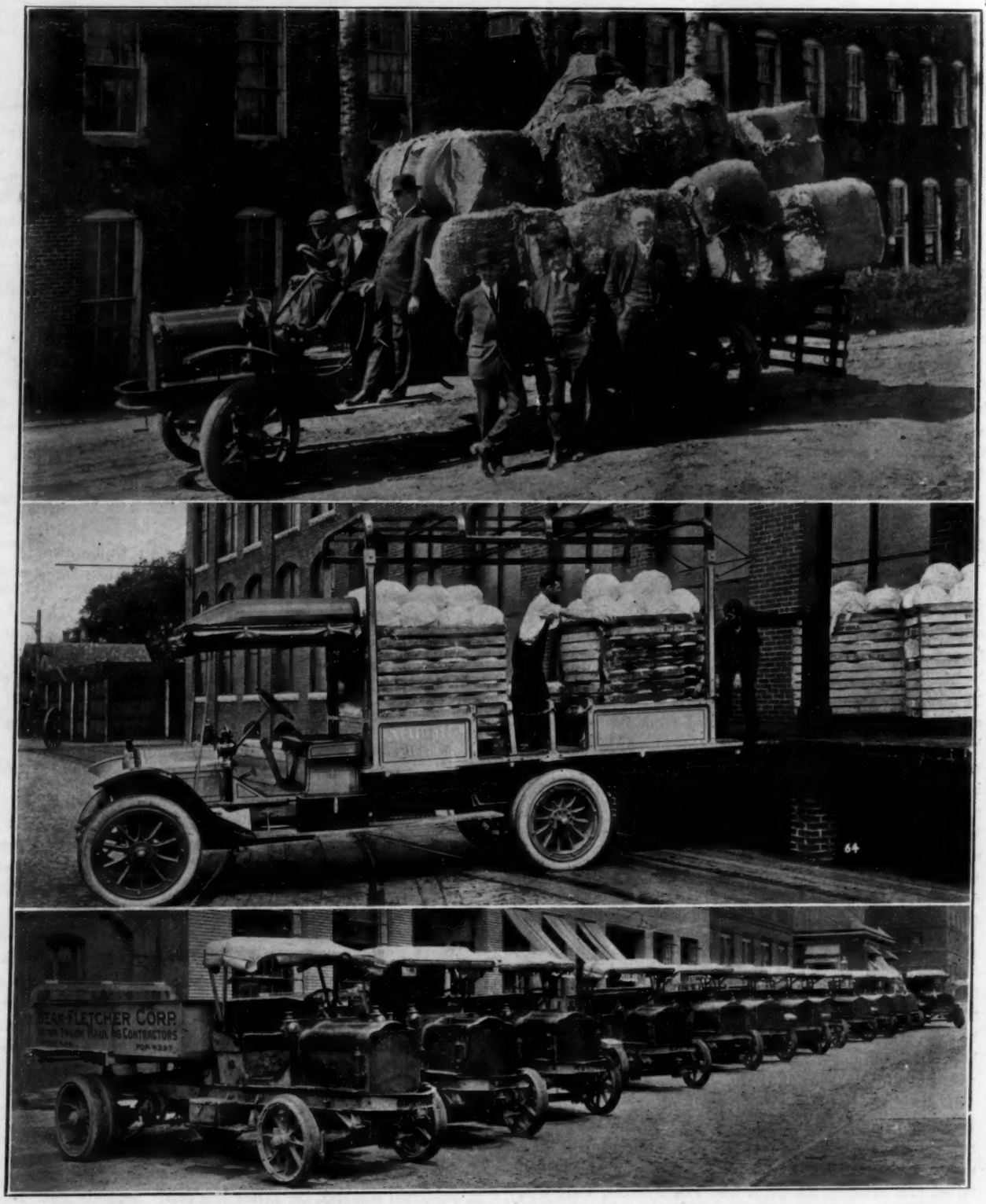
Transportation problems arising from war congested railroads are facing the cotton manufacturer at every turn, and he, as is the case with practically every business man, is interested in what is being accomplished to overcome these problems. In this connection, the accompanying facts and illustrations will be of interest.

Fleets of heavy duty motor trucks along the Atlantic seaboard are playing an important role in supplying rapid inter-city transportation between New York and other eastern points for large consignments of freight, machinery, materials, foodstuffs, and supplies necessary to the commercial and governmental preparedness program for winning the war.

Freight congestion and embargoes have been lifted by these sturdy and dependable vehicles in the delivery of raw and finished materials. Regular schedules are being main-



AT THE TOP, ONE OF THE TRUCKS OF THE LOUISVILLE COTTON MILLS. IN THE CENTER, ONE OF THE AMERICAN WOOLEN MILL'S TRUCKS AT BOSTON. AT THE BOTTOM, A FLEET OF TRUCKS OPERATED BY THE WEST JERSEY. SAND AND SUPPLY CORP., PHILADELPHIA.



AT THE TOP, ONE OF THE TRUCKS AT THE CANNON MILLS. IN THE CENTER, A TRUCK AT THE ARLINGTON MILLS, LAWRENCE, MASS. AT THE BOTTOM, A FLEET OF TRUCKS EMPLOYED BY THE BEAM-FLETCHER CORP., OF PHILADELPHIA.

tained in transporting shipments from Boston, Philadelphia, Washington and Baltimore to other ports on the Atlantic coast. Frequently trips are made from Pittsburgh to New York.

In the great lumber districts in the northwest, trucks have gone into the forests and brought out millions of feet of spruce and other lumber used in the building of aeroplanes, ships and other much needed war necessities in about half the time that would ordinarily be required.

As an instance of inter-city transportation, the Beam-Fletcher Corporation, of Philadelphia, operates a fleet of twenty-two trucks on regular daily schedules between Phila-

delphia and New York. The trucks have been in service over this route since July first. One part of the fleet leaves Philadelphia at 8 o'clock at night and arrives in New York the following morning at 6 o'clock. At some point between the two cities the Philadelphia train meets another fleet which leaves New York at 5 o'clock in the afternoon and due to reach Philadelphia at 3 o'clock in the morning. Under present conditions to ship the same consignments by freight would require five to seven days.

On specified days in the week or by special arrangement, trucks make trips to Washington, Baltimore, Wilmington, Hartford and New Haven, Conn., Springfield and Boston, Mass., Providence, R. I., Harrisburg, Reading and Bethlehem Pa., Trenton, Newark and Jersey City, N. J., and other cities located in nine different states.

Corporations such as the one named and the West Jersey Sand and Supply Corporation also of Philadelphia, will handle any shipment from one pound to several thousand and guarantees delivery direct to the consignee. Frequently the value of the loads makes it necessary to insure them for as much as $50,000 for a single trip.

Recently 14,000 pounds of finished leather was carried from Philadelphia to New York for export shipment. Movie films of one of the largest companies are carried daily between the two cities. Machinery, clothing, woolen goods, textiles, foodstuffs and fish have been carried on other trips. Eighteen trucks have carried 180,000 pounds of music records to New York in a single day. Two tanks each 20 feet long, 8 feet wide and 3 feet high, and weighing approximately 24,000 pounds were hauled by two trucks a distance of 14 miles from Chester, to Reading, Pa. Materials for the making of batteries have been hauled from Philadelphia to New Haven, Conn., a distance of 275 miles. Early in November five tons of supplies for the Red Cross were loaded in Philadelphia and delivered in Boston for export shipment. The distance of 330 miles was covered in less than two days. Large quantities of yarns and raw textile mill materials have been hauled from Philadelphia to New York and then reshipped to New England points in order to avert demurrage due to an embargo effective on shipments from Philadelphia to many New England points.

These illustrations will show the value and usefulness of this particular branch of transportation work. However, the Post Office Department announces that within, perhaps, the next three months, motor truck parcel-post routes will be in operation in various parts of the country aggregating between 3,000 and 4,000 miles. One chain of motor routes will extend from Portland, Me., to New Orleans. Another will cover much of a large stretch of territory in Ohio, Indiana, Illinois, and West Virginia. On the Pacific coast routes will be established between San Francisco and Sacramento, Cal., via Stockton and Fruitdale, a distance of 125 miles, and between Redlands and Los Angeles, Cal., a distance of 76 miles.

It is the belief of the Post Office Department that the operation of these routes and others to be established will materially aid in the distribution and in lowering the cost of food products.

The existing law does not provide for the employment of Government-owned motor trucks on rural-delivery routes, nor does it require the rural carriers to use motor vehicles.

In the star-route service, however, where the mail is carried under contract, a recent law permits the Post Office Department to designate the sort of vehicles to be employed, and in awarding new contracts the department will specify that motor trucks shall be employed on all routes where the roads are such as to admit of their use. These contracts are advertised for bidders, and where payment asked for the service is deemed to be excessive the department is authorized to provide Government-owned motor trucks and to employ drivers for the operation of these routes.

A further extension of the employment of Government-owned motor vehicles by its adoption for the parcel-post service of the rural routes will be made whenever Congress enacts a law now pending for that purpose.

The routes already in operation with Government- owned trucks are from Washington, D. C. to Leonardtown, Md., a distance each way of 54 miles; from Annapolis, Md. to Solomons, Md., a distance each way of 65 miles; from Washington, D. C. to Baltimore, Md., via Ridgeville; from Baltimore to Philadelphia, Pa., via Belair, Md., Oxford, and West Chester Pa., a distance each way of 110 miles; and from Baltimore to Gettysburg, Pa., via Westminister, a distance each way of 53 miles.

Routes in the Middle States will form a chain from Indianapolis, Ind. to Columbus, Ohio; Columbus to Zanesville, Ohio; Zanesville to Wheeling, W. Va.; Wheeling to Pittsburgh, Pa.; Pittsburgh to Uniontown, Pa.; Uniontown to Cumberland, Md.; Cumberland to Hagerstown, Md ; Hagerstown to Staunton, Va.; Staunton to Lynchburg, Va.

Further extensions contemplated but not yet surveyed are from Charleston, W. Va. to Columbus, Ohio; Columbus to Cincinnati, Ohio; Cincinnati, Ohio, to Louisville , Ky.; Louisville to Chattanooga, Tenn.; and Chattanooga to Atlanta, Ga.

A most graphic story of the motor truck in New York city is contained in the records of the Auto License Bureau mainained by the secretary of state in that city. It is here that the real record of the marvelous advance of the motor vehicle can be seen and accurately measured, and the figures are such as to effectively put at an end any idea that the motor vehicle is not making tremendous strides and being used for all imaginable purposes. It is now planned to make Seventh Avenue a great motor highway from the west side piers to 59th street.

Work for the motor truck around the cotton mill is naturally governed by the conditions surrounding each individual mill, but the rapidly increasing number of such vehicles and the widely varying purposes to which they are being applied, indicates the present trend in the textile industry.

The volume of business done in cotton goods at Zanzibar is an index to the prosperity or depression in the country in a given year. As these fabrics constitute a prime necessity among the native and Indian populations, and, as it is in universal demand, the gauge is a fairly accurate one. In 1914 the value of the piece goods imported declined 29.7 per cent as compared with 1913. This decrease was primarily due to the cutting off the reexport trade with German East Africa, where the demand on Zanzibar for such merchandise was considerable before the war began. As the population of the archipelago is not increasing and as direct shipments are becoming more and more the practice for continental distribution, the imports of piece goods will not materially and permanently increase even with the restoration of peace.

Dyestuffs Association of America

At a meeting of dyestuff manufacturers and dealers at the Chemists Club in New York City, on January 22nd and 23rd, an organization was formed by which dye makers of this country can protect themselves against German competition after the war, raise the industry to a high level of efficiency by standardization, and make provision for protecting customers against unscrupulous men who sell dyes that do not come up to their samples.

Incidentally, the manufacturers put themselves flatly on record as refusing membership in their new association to any company not headed by an American and owned or backed by American capital. The issue was partly one of patriotism and partly to shut out what many of those present looked upon as an insidious attempt on the part of Germany to disrupt the growing industry here, so Germany would find it easy to recapture lost ground after the war.

About 125 manufacturers and dealers were present and the unusual condition of there being more manufacturers than dealers was noticed. These two elements had some difficulty in getting together on their relative status in the association, but all differences were finally adjusted.

A board of arbitration to settle differences between manufacturers and their customers was also recommended at the convention. It was shown the methods used by some unscrupulous men in imposing on their customers are such that cannot be settled satisfactorily in court and only expert chemists are competent to determine the right of the issue. By the action of such a board a dishonest seller of dyes who did not deliver what he contracted to deliver would be banned from the association and discredited before the buying public.

The First Day.

There were two sessions held on Tuesday the 22nd, the morning being largely devoted to general discussion on the main subject of the desirability of forming such an association and how it should be organized; the afternoon session, in listening to several interesting addresses on live topics and advice from experienced leaders. Among the latter were the following speakers and subjects: "The Feasibility and Necessity for a Dyestuffs Association," H. Gardner McKerrow; "pitfalls of Trade Associations," Benjamin M. Kaye; "Standardization," Dr. J. Merritt Matthews; "Problems Met With in Standardization," Dr. Wallace Pierce; "Arbitration," Bradford Webster; and "The Patent Law in Relation to Dyestuffs," A. E. Parker.

The first session was called to order by H. Gardner McKerrow, who has been chiefly instrumental in bringing about the meeting and who issued the call. Mr. McKerrow is manager of the textile department of E. F. Drew & Co., and has long been a leader in the development of an American dyestuffs industry. He briefly outlined the purpose of the gathering and called for the choice of temporary chairman to preside till the organization had chosen more permanent officers and plan of organization.

Mr. McKerrow then delivered his opening address, saying in part:

When the suggestion was first made that the dyestuff manufacturers and dealers of this country should be invited to take part in this Convention, the central idea which prompted the move was that of the advisability of devising some means for the standardization of American dyes.

As the preparations for this meeting progressed, however, the initial idea expanded considerably until it became apparent that the first and most advisable step to be taken was to form a commercial association representing the dyestuff industry as a whole, and having under its care and jurisdiction not only the question of standardization, but other collateral questions of equally great importance to the industry, such as questions of Tariff, Patent Law as affecting the dyestuff industry, Arbitration of Disputes, Protection of Contracts, and other matters which, as the new industry becomes of more and more importance, call for treatment of an authoritative nature in the interests of all rather than the individualistic attention from diverse and divided interests which is all that such questions have received hitherto.

This, therefore, gentlemen, will be the first matter to be brought to your attention,—the question as to whether we shall form a National Dyestuffs Association, and if so, the form it shall take, the duties it shall assume and the character of its government. It would appear that the right time to effect such a central organization is during the infancy of the industry, for it is then that the interests of all factors, both large and small, can be most equitably safeguarded and that the fundamental basis of its ultimate control can be established under such conditions as will best adjust themselves automatically to whatever its future growth may be.

While the general idea of standardization was almost universally admitted to be something which it was eminently desirable to accomplish, a considerable conflict of opinion developed. The opposition to it may be roughly classified as of three kinds,—first that of the man who honestly believes that it cannot be done, and in this regard I would remind you gentlemen, that it certainly was done by the German dyestuff manufacturers, and if it could be done by them, there is no conceivable reason why it cannot be done by American manufacturers. We have at the present time a complete list of probably less than one hundred aniline colors made in this country and these are for the most part of well recognized standard types, whereas it must be remembered that the standardization of German dyes included a line of upwards of one thousand colors including not only distinct homogenous colors in themselves but a vast variety of compounds and mixtures and shades.

It is not suggested that in establishing such a line of standards under the authorization of the association the very highest types and strengths of colors produced should be adopted, to which all manufacturers would be expected to conform, but that an average, workable standard, which would be within the reach of all manufacturers honestly endeavoring to produce reliable goods, should be devised. It is quite possible that some offerings may run ten or even twenty per cent higher than this standard, in which case the material offered would be worth relatively more money, while other offerings might be ten or twenty per cent below the standard, in which case the manufacturer would be entitled to the value represented by his material

or would be impelled to improve his method of production so as to reach the trade standard.

It is to be borne in mind further that it is practically indispensable to the purposes of the United States Government that some form of standardization should be adopted for the purpose of assessing and levying duties on imported colors.

Wherever this duty takes the form of a specific rate, that is to say an impost of so much per pound, the question of the degree of concentration is immediately raised. There must be a starting point which the Government can adopt and against which importations can be compared for the purpose of determining the degree of concentration. It has been shown by past experiences that dyestuffs can be imported of four and five times the concentration of ordinary recognized trade standards, and yet these importations carry no higher specific rate per pound than the trade standards as recognized before the war, thus defeating a very large proportion of the protective intent of the act.

Another species of opposition to the question of standardization has been from the purely technical interests in contra-distinction to the practical interests. These gentlemen seem to be opposed to the idea chiefly on the ground that it has never been done hitherto and therefore that it is not amenable to accomplishment. This is the kind of opposition which inevitably confronts all new movements of this kind, and which can be safely left to take its proper place in the final consideration of the question.

A much more dangerous and insidious opposition is that of those elements which seem to think that it is not to their interest to see any method of standardization adopted for American dyestuffs. Whether this is actuated by a belief that they themselves will establish and provide a Standard to which all other makers will be compelled to align themselves or go out of business, or whether they have even more ulterior motives, and have an unexpressed idea of keeping the American dyestuff industry in a chaotic and confused condition and thus render it a fertile field for re-exploitation in the interests of the German dyestuff manufacturers when normal conditions are restored, is a question that should be carefully considered and guarded against.

On the question of Arbitration, this again is something which is essentially collateral to the question of standardization. Our courts have been congested with disputed cases during the past three years, practically all of them based on claims that deliveries have not equalled samples offered. In some cases these claims have been made in good faith; in others they have been just as evidently made in bad faith and in order to offset the conditions caused by a falling market or to obtain discounts to which the purchasers were not entitled. At present, the only way of adjusting these is through processes of law, and to this there is no limit of time or expense involved.

Another issue closely allied to the questions of Standardization and Arbitration of disputes, is the one of the Protection of Contracts. The same body could very properly be invested with an adjudicating power as regards the protection of contracts. This is a question which is going to be of vital and widespread interest when conditions begin to attain normality, even if it has not become an active factor in the business as yet.

In the panic-striken times of 1915-1916, the color consuming industries were willing to sign contracts at almost any price, some of these contracts running for periods of two and three years from that date. Now a contract is not a contract unless it is equally binding on all parties thereto, and the difficulty is that a great many contracting parties only desire to be bound by a contract while it still operates in their favor. As soon as the market falls and prices range lower, they are apt to demand to be released altogether from the contract, or to have it adjusted so as to correspond with the new conditions. Where the manufacturer can do this without loss to himself by reason of his ability to buy his raw materials at lower cost, it is undoubtedly commercial wisdom for him to do so; where, however, the manufacturer has committed himself in good faith to other contracts on his part for raw materials, to which he is compelled to adhere, a breach of contract on the part of his customer at once works manifest injustice to him.

Benjamin M. Kaye, an attorney with a broad experience in trade association formation, gave the association the benefit of his ideas as to what should be done to bring about such an organization as is desired. That there is benefit in such associations, he said, admits of no controversy, for so many trades have organized and found it so effective and beneficial that the report of the Department of Commerce in 1915 referred to over 500 organizations in the national field of various trades. In every trade, he said, there has been felt the need for starting such organizations. Trade jealousies and the mutual distrust of competitors breed conditions that can best be met and overcome by bringing together the victims of misunderstandings. Once having discovered the benefits in co-operation business men prefer to perpetuate their conference into continuing associations.

The meeting then proceeded to a general discussion of the feasibility of an association and what should be its scope and membership, at which time some differences arose between the manufacturers and dealers as to the standing of each class in the organization. Committees from each class were selected and while they were in conference, the main meeting took a recess for luncheon.

At the afternoon session Dr. J. Merritt Matthews presented the report of the conference committees. It had been agreed that there be two classes of members; first, the manufacturers of dyestuffs and intermediates as active members, and second, an associate member class for dealers, with no vote, but with a representation on the executive committee and with membership qualifications to be determined by the associate members.

The report was accepted and the details of organization turned over to the following committee, with orders that they report at noon Wednesday. H. G. McKerrow, New York City; Dr. J. Merritt Matthews, New York City; L. A. Ault, Cincinnati; W. S. Woodward, New York City; S. R. Davids, New York City; August Mertz, New York City, and T. N. Hyndman, Philadelphia.

After listening to several other speakers, adjournment was taken until Wednesday.

The Second Day.

The second day's session was called to order at 11 o'clock by Dr. D. W. Jayne, of the Barrett Company, acting as the deputy for Chairman Frank Hemingway, who had been called to Washington over night. After a brief explanation he introduced Dr. Grinnell Jones, dyestuffs

expert of the United States Tariff Commission, to address the convention on the intentions of the Government in regard to its dye tariff policies.

Considerable discussion followed Dr. Jones' paper, chiefly indicating a belief that protection will be absolutely necessary to make the American dye industry capable of meeting German and other foreign competition after the war. The discussion was led off by Dr. A. Brooking Davis, of Ault & Wiborg, Cincinnati. He suggested that the term intermediate be defined more fully and also that the law should be amended so as to fix the number of chemical steps taken in manufacturing intermediates so that if the product was further altered it would cease to be an intermediate. Dr. Jones replied that this plan had already been put forward and that the term intermediate had been carefully defined in the law and a list of well known intermediates mentioned.

With the close of Dr. Jones' paper and the discussion, the committee on organization reported, through its chairman, Dr. J. Merritt Matthews. The report in full was as follows:

The organization committee appointed by the chairman of the convention of the Dyestuff Manufacturers of America duly met and organized by electing Dr. J. M. Matthews as chairman of the organization committee.

The matters submitted to the organization committee by the convention have been duly considered and the committee recommends that it be continued in power until the first annual meeting in order that the various details of membership, incorporation, committees, etc., may receive proper attention. It suggests that the convention adopt the following resolution:

Resolved, that the organization committee appointed by the chairman be empowered to continue to act as such until the first annual meeting of the association with power to—

1. Prepare and file a certificate of incorporation.
2. Prepare by-laws for submission at the annual meeting.
3. Arrange the time and place of the annual meeting.
4. Entertain and pass upon applications for membership.
5. Confer with the Tariff Commission and report at the annual meeting.

And be it further resolved that the temporary chairman, secretary and treasurer elected by this convention continue to act as such until the annual meeting.

The organization committee further suggests as a matter to be considered by the convention, the name of "Dyestuffs Association of America" as the name of this association.

In the discussion of this recommendation it developed that there was a strong feeling in favor of adding the word "manufacturers" in the title, but on the other hand there was a feeling, in which the organization committee shared, favoring keeping the style as broad as possible, in order that others than manufacturers might participate in certain forms of membership.

Then, again, the Committee on Organization suggested that there might arise complications incidental to the formal action on incorporation, and finally the whole matter was left to the committee to work out in accordance with the expressed wishes of the delegates as shown in the discussion.

The committee's report was then adopted as a whole, its recommendations adopted and the conference adjourned to meet as per the recommendation on March 6, at 10:30 A. M. at the Chemists' Club.

The temporary officers who are to serve till the regular officers under the by-laws are chosen, are:

Chairman, Frank Hemingway of New York City; Secretary, C. Cyril Bennett of the "Color Trade Journal," New York City; Treasurer, C. D. Jenkinson of the National City Bank of New York.

Manufacturers Discuss War Problems.

A conference on war problems in the textile industry was held on January 18th at the Copley Plaza Hotel, under the auspices of the Committee on Social Welfare of the National Association of Cotton Manufacturers, and was attended by representatives of cotton manufacturing and other industries.

Albert Farwell Bemis, president of the National Association of Cotton Manufacturers, opened the conference with an outline of its objects, and Robert A. Woods, of the South End House, Boston, one of the best known authorities in the country on social problems, and president of the National Conference on Social Work, spoke of the social side of the industrial problems arising from the war. Other addresses were made by Frederick Lee Ackerman, of New York, on "Industrial Housing as a War Problem"; Miss Frances A. Kellor, of the National Americanization Committee on "Stabilizing Labor for War Work"; George W. Tupper, immigration secretary of the Young Men's Christian Association, on "Labor Supply After the War"; Dr. Frederic J. Cotton, Boston, who conducted the discussion on "Fitting the Crippled Soldiers for Self-Support", with the aid of Thomas B. Kidner, vocational secretary of the Military Hospitals Commission, Ottawa; Dr. E. A. Bott, of Hart House University, Toronto; Major Harry E. Mock, of the Surgeon General's office, Washington; Mrs. James H. Peck, of Montreal, and Frederic W. Keough, editor of "American Industries," New York city. Dudley M. Holman, formerly of the Massachusetts Industrial Accident Board, led the discussion on "Health and Safety in Industry Under War Conditions" with the assistance of Major Frank B. Gilbreth, of Providence, Dr. William J. Brickley, a widely known surgeon; Douglas C. McMurtie, of New York, and Louis I. Dublin, of the Metropolitan Life Insurance Company, New York.

Miss Kellor predicted that "the science of man-power" will be a new industrial development that will come after the close of this war, that it will not be developed in Washington, but in each industrial plant, and that as a result there will come new standards that sooner or later will affect every angle of the labor problem.

Strikes, which have prevailed and seriously handicapped many American industries since the war started, are now practically impossible in England. The Government and the unions have reached a workable basis for adjusting hours and compensation. When the war comes to an end, Miss Kellor forecasted that Great Britain will experience industrial peace, but such will not be the good fortune of America—at least not unless many problems of capital

and labor are handled more intelligently than they are being handled to-day. Other speakers discussed what Great Britain has done to meet the demands of industrial workers during the trying times of the war when problems unlike any ever before dealt with have been taken up and settled in a most satisfactory manner.

Mr. Ackerman, who is a well-known New York architect, who has recently completed a painstaking study of housing problems in Great Britain as affected by the war, dwelt particularly on the centralized plans, and his remarks were followed with special interest because of their bearing on the immense industrial housing problems now becoming evident in this country in connection with the many great new war plants that are being established and the prospect that Federal Government will undertake to finance a considerable part of the work as incidental to its war expenses.

"The Labor Supply After the War" was discussed by George W. Tupper, who called attention to the fact that to-day our industries are overwhelmed with orders. Our employment managers are calling for help. That to add to our industrial confusion one and a half million men have been transferred from the ranks of industry to the ranks of cantonments. Now the manufacturer seeks prophecy concerning the labor supply after peace has been declared.

Unfortunately, he said, "the first information which comes from 'over the top' is rather discouraging. Over a year ago a comprehensive inquiry instituted by the National Chamber of Commerce showed that transportation companies, ticket agents and immigrant bankers were of the opinion that between 500,000 and 750,000 would immediately return to their native lands as soon as actual fighting ceased. To-day there are many indications that these figures are conservative.

"The first of these indications came from the opinion of best informed racial leaders. While these opinions are based on undetermined factors—who wins in this war and the future of the so-called nations—they point toward a large return of their fellow countrymen to native lands."

This is chiefly true of Poles and Lithuanians, Mr. Tupper said, adding that the indications were that the great proportion of Greeks and Italians would remain here. Porto Rico, he said, is likely to send many laborers here.

Dudley M. Holman, formerly of the Massachusetts Industrial Board, spoke on "Health and Safety in Industry Under War Conditions."

"By cutting the wastes in two we can reduce insurance premiums", he pointed out, " extend benefits, lower cost sheets and increase output, for the toiler who works amid safe and healthful surroundings in well lighted, heated and ventilated workshops will be more productive and more contented. The labor turnover will be lessened proportionately for men and women who are contented do not join the army of floaters who drift from state to state and from city to city, and this turnover cost is another tremendous drag on industry, but so closely allied to the accident and health problem as to be a part and parcel of it"

Frederic W. Keough, editor of "American Industries," spoke on the opportunities in American trades for the disabled soldier.

"The United States has resolved that every returned soldier shall have a full opportunity to succeed," he said. "When necessary, war cripples must be thoroughly trained in schools and industry, and industrial opportunities must be disclosed for those who need occupation. Jobs must be adapted to them, in order that they may become competitors in every sense with the workers who are whole. Occupations that do not exist must be brought into being. Certain work must be reserved for cripples, and devices must be discovered and adapted that will fit the victims of war back into all the ordinary activities of life. The responsibility is shared by every citizen.

"The National Association of Manufacturers, in its investigation of opportunities, has been assured of thousands of openings that await disabled soldiers and sailors, and innumerable other places will be found where in they will be welcomed, not merely on a sympathetic basis, but on conditions that will restore them to economic independence, prosperity and happiness."

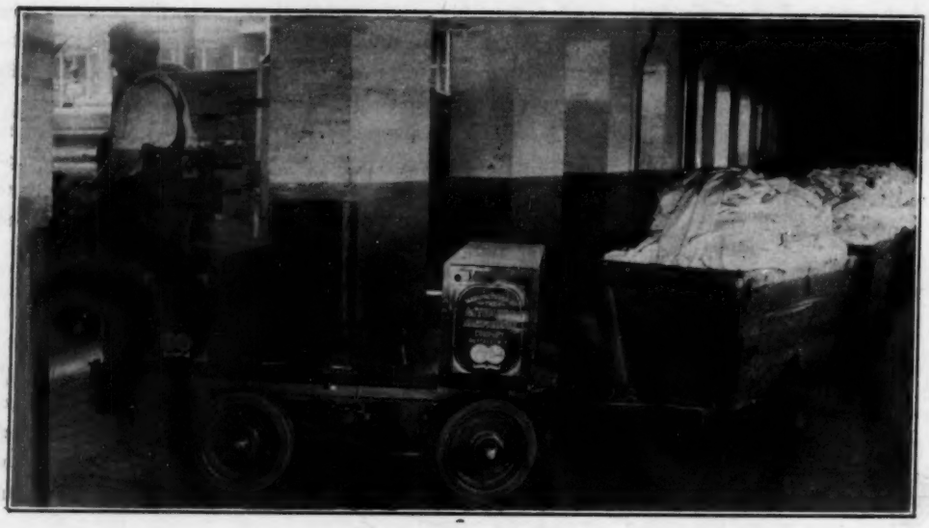
Dyestuffs in the Textile Industry.

The most recent number of the tariff information series of the United States Tariff Commission is a pamphlet on "The Dyestuff Situation in the Textile Industries, 1913 and 1916." In it are presented the results of an inquiry sent to 77 companies who are representative consumers of dyestuffs in the textile industries. Of the companies reporting, 23 were engaged in cotton manufacture, 25 in wool manufacture, 8 in silk manufacture, and 21 were independent dyers and finishers. The cotton manufacturers were the only group reporting the use of a smaller quantity of dyestuffs in 1916 than in 1913. A substantial increase as reported by the other groups would seem to indicate that by 1916 the domestic manufacturers of dyestuffs had made considerable progress in replacing foreign-made dyes with those of American manufacture.

The increase in the costs of the individual dyestuffs is particularly striking. In some instances alizarin and anthracene colors were purchased in 1916 at prices 20 to 30 times those paid in 1913. The total value of all the dyestuffs consumed by the 77 companies in 1916 was approximately four times the value of the dyestuffs consumed in 1913. The greatest shortage occurred among the dyes which were not made in this country before the war, particularly in the case of synthetic indigo and the vat dyes from anthraquinone needed by the cotton dyer and the alizarin colors needed by the wool manufacturers. Vegetable indigo and natural dyes such as logwood and fustic came into importance as substitutes for the coal-tar derivatives. American-made sulphur colors were given a wide application and certain gallocyanine dyes were developed to replace the imported alizarin and anthracene blue.

The opinions of the textile manufacturers as to the operation of the present dyestuff schedule of the tariff and their suggestions for changes to meet the conditions after the war form what is perhaps the most interesting part of the report. These opinions, which are quoted without the indorsement, criticism, or comment of the Tariff Commission, indicate that on the whole the textile consumers of dyestuffs will give the new American industry the support and patronage that will insure its continuance after the war.

Borrowing money and trouble are often one and the same thing.



Reducing Costs.

Two business factors stand preeminent today in the mind of every cotton manufacturer or other employer of labor: first, the severe shortage of experienced operatives, as well as unskilled labor necessary to operate his plant; and second, the extraordinary high price that all labor commands regardless of its experience or ability. The cause is well known and so long as the war continues this labor stringency will doubtless continue and perhaps increase.

With these incontrovertible facts before us it becomes necessary for every manufacturer to devise ways and means to overcome the first factor, the labor shortage. This he does, when possible, by employing women to replace men. However, owing to the character of the work, it is sometimes inadvisable or entirely impossible to utilize female labor, and always the manufacturer is up against the second factor of the problem, the high cost of his labor. Therefore, in every instance, where he can by the adoption of a machine, save the wages of several men by allowing one operative to do the work formerly accomplished by three to five or perhaps more similar operatives, he is not only achieving something of immediate value in his plant, but he is also building for the future when foreign competition will make high cost production an expensive luxury.

One of the methods which is being adopted in many factories is the use of industrial trucks, tractors and trailers. A glance at a few of the illustrations will convince any employer of labor of the distinct advantages to be gain-

ed from mechanical devices of this character that tend to materially lessen the number of men needed to do a certain amount of work and at the same time accomplish this work in a better and quicker manner and with a decided saving in wages.

There are two types of industrial trucks in common service, the load carrying type which combines the power unit and the load carrier in one truck, and which may be noted in some of the accompanying illustrations; and the tractor type which performs the power duty alone and operates loads by the use of trailers or ordinary mill trucks. Each type has distinct advantages and the selection depends largely upon local conditions around the plant of the individual manufacturer.

These industrial trucks may be equipped with suitable steel bodies for handling coal. Such bodies are arranged to dump sidewise or endwise very much as a tip cart would dump, leaving the coal in a suitable and convenient pile adjacent to the boiler front and ready at the hand of the fireman. This is particularly convenient where coal is unloaded from an overhead car trestle located in the mill yard, perhaps some distance from the boiler room proper.

In the South, where plenty of cheap negro help was formerly available, the steel wheelbarrow with its individual "darky" motor answered all purposes, but today, with those same darkies difficult to obtain, it is much more convenient and economical to put the "yard gang" at work on the coal pile for a short time until sufficient coal is placed in front of the boilers for the day's run and then shift this same "gang" to the warehouses where the cotton is pulled out and transported by means of the industrial trucks to the opening room.

After accomplishing these two regular daily jobs in connection with cotton manufacturing, the same trucks and the same "gang" can be utilized in unloading any freight which may have arrived at the mill that morning; the transportation of any new machinery or machine parts to that particular part of the plant where they are to be erected; the moving of loom beams from the slasher room to the weave room and the return of empty beams to the slasher room for new warps; the transference of cloth room production to the warehouse or to the cars where it is to be loaded for shipment; and a thousand other similar jobs that will arise from time to time in the minds of the superintendent, the master mechanic and others desiring materials moved promptly and efficiently.

These trucks form but one type of mechanical assistants that are awaiting the call of the mill manager. Descriptions of labor saving devices may be found in every issue of COTTON and are worthy of careful examination and consideration.

The Link-Belt Company, 39th St. & Stewart Ave., Chicago, Ill. are distributing a twelve sheet calendar printed in three colors and containing a separate illustration on each page. This calendar is approximately 16x25 inches in size. It contains not only a large reproduction of the current month dates, but also the preceding and succeeding months on each sheet. A copy will be sent to responsible concerns who write requesting it.

Mill Conditions and Market Reviews.

What the Southern Mills Are Doing.

From time to time I have pointed out in these columns the tendency of Southern cotton manufacturers to improve their villages and cooperate with the operatives. This work has assumed many forms, and examples of mill canning plants have been illustrated and described where the home grown products of the operatives were canned at cost for winter use. This feature has been adopted by a number of mills and during the months to come will doubtless see further installations of a similar character.

Another feature of this work has been the adoption and installation of machinery for wet wash laundries, giving the operatives sanitary clothes washing facilities at cost. Installations of this character are in successful operation in a number of Southern mills. However, I am advised that the Greenwood Cotton Mills of Greenwood, S. C. have gone this proposition one better and is operating a wet wash laundry free of all charges to its operatives. This method was adopted owing to the extreme scarcity of labor which made it almost imperative for operatives to remain away from the mill to do their own washing as they were unable to secure outside aid in this direction.

Another feature which has taken a strong hold of Southern cotton mills is the use of concrete and cement sidewalks and gutters. Quantities of this material have been already placed and a great deal more will be laid from time to time as improvements around mill villages continue. One Georgia cotton manufacturer when questioned as to why he spent so much money in running a concrete sidewalk from his mill to the operative's homes, said that it was considerably cheaper to lay the cement sidewalk than to pay for the cotton that the operatives would use in wiping the mud from their shoes, when the present prices of the raw staple was considered. It's a business proposition pure and simple, and its going in.

The Anchor Duck Mills of Rome, Ga. have practically completed their cement sidewalks and gutters as well as cement walks leading to each individual house throughout their village. The Greenwood Cotton Mills at Greenwood, S. C. have completed cement sidewalks in approximately three quarters of the village. The village of Ninety-Six, S. C., the home of the Ninety-Six Cotton Mill, has cement sidewalks over the village, together with cement curbing and gutters. The Panola Mills at Greenwood, S. C. are planning to lay cement sidewalks in the mill village in addition to the grading of the streets and the installation of electric lights on the streets and in the homes. The Grendell Mills No. 2 of the same town have already graded and placed cement sidewalks on every street in the village.

Capt. E. A. Smythe, president of the Belton and Pelzer Cotton Mills near Greenville, S. C., has recently let a contract to the Cement Products Co., of Wilmington, N. C., for the installation of the "Sanisep" portable sewerage disposal systems, manufactured by that Company in these two mill villages. This contract calls for disposal systems to take care of something over a thousand tenant houses in the two mill villages. The equipment will be shipped from the Wilmington, N. C., plant of the Cement Products Co., complete ready to be installed, and the installation will require about 90 days. Among other mills which have recently installed "Sanisep" systems are the Arcadia Mills, Spartanburg, S. C., Warren Mfg. Co., Warrenville, S. C., Brandon Mills, Greenville, S. C., Southern Mfg. Co., Athens, Ga., Dixie Cotton Mills, LaGrange, Ga., and the Taylorsville Cotton Mills. Taylorsville, N. C.

The Exposition Cotton Mills at Atlanta, Ga. are planning to erect a number of new cottages and it is reported will spend about $10,000.00 on this work.

The Advance Mfg. Co., of Fayetteville, N. C. which was recently chartered with a capitalization of $100,000, will build brick mill building 132 feet long by 50 feet wide.

A guncotton mill is to be established at Rome, Ga. by Elmore, Brame & Company, the well known cotton firm of Montgomery. Ala. A building has been leased which will be improved and equipped with machinery. A warehouse will also be built.

The Roanoke Mills Company of Roanoke Rapids, N. C. has filed a certificate of amendment to its charter increasing the capital stock from $500.000 to $2.000,000.

The Hillsboro Cotton Mills at Hillsboro, Texas, have awarded the contract for enlarging the main mill building. Robert & Company, of Atlanta, are handling the engineering end of the proposition and the expenditure for building and machinery will be approximately $150.000.

The Arrow Mfg. Co. has been organized by J. H. Separk. of Gastonia, N. C., and associates with a capital stock of $300,000. The Daniel Cotton Mills at Lincolnton, N. C. have been purchased for the new company.

The Mt. Vernon-Woodberry Mills have accepted plans and specifications for building an additional mill structure four stories high to cost approximately $20.000. J. E. Sperry of Baltimore, is the architect.

The Manchester Cotton Mills of Manchester, Ga. have awarded the contract for an addition to the main mill building four stories high and 100 x 60 feet in dimension to T. C. Thompson & Bros., of Charlotte, N. C. This building is to be of mill construction. Robert & Company, of Atlanta, Ga. are the engineers in charge.

The Texas Textile Company of Houston, Texas, have completed the plans and specifications for a mill building one story high 200 x 60 feet in dimension. This will be of reinforced concrete and hollow tile construction. It is to be equipped with machinery for a daily capacity of 2000 pounds of absorbant cotton. B. M. Garrett is President.

The Belton Yarn Mills, at Belton, Tex. have completed the plans and specifications for the addition to their mill which will be 120 feet by 80 of brick construction. This building, which will cost approximately $20,000 will be equipped with machinery to increase the output of hosiery yarn manufactured by this company.

The Fort Prince Spinning Company of Wellford, S. C., a recently organized company, will equip their mill with 3200 spindles and manufacture 10's to 20's single and ply yarns. Alfred Moore is president.

New England Mill Situation.

The scarcity of coal and the severe weather combined have affected nearly all the mills very seriously. Even at tidewater points, like Fall River, New Bedford, and Providence, it was difficult to get supplies. The navy has been commandeering tugs and barges for some months past and the mills were unable to secure their normal winter supplies before the inland waters became frozen. The mills dependent upon car service were affected by the lack of transportation facilities. At different times before the fuel administrator issued the order for a five day's shut down several of the mills were obliged to cease operations for a time. The easing of the weather and the stronger effort made to clear up the congestion on the railroads were helping materially to clear up the situation when this was written and it is now believed that the worst is over.

When the fuel order was first issued operatives found little fault, but apparently taking their cue from the vigorous protests of manufacturers some of their associations began to join the chorus of denunciations. It was considered an unfortunate view to take as it soon became known that conditions were becoming not only serious for the operation of mills but actualy dangerous for the financial future of trade at the time the government announced its drastic step toward attempted correction.

A great deal of merchandise is held up on the railroads, at terminals as well as in cars. Merchants were paying for goods they were not receiving and were forced to borrow to carry along their trade at rates that were too high for comfort. Many mills have cotton on the cars due them months ago and they were being forced to buy spot supplies at high prices. The new rule of the mills, by which goods are delivered at mill instead of f.o.b., New York, was tending to throw added burdens on the buyers, and taken altogether, there were some phases of the situation not much talked about that warranted some strong action toward affording relief.

Mills are still far behind on their orders and many of them cannot catch up before summer. The cutting out of four per cent of the production by the shutting down of the mills seemed the last straw to overwrought manufacturers and that probably led to the many vigorous protests made through local chambers of commerce and other trade organizations to the political leaders at Washington. Soon after the first closing orders were issued modifications were announced permitting some of the mills employed on government business to operate their plants as usual. It is expected that where the army or navy needs goods that are being made further modifications will follow.

The disorganization of business arising from congested transportation was greater than was commonly supposed. Selling agents of mills have been saying for some time that a material part of the feverish demand for merchandise was the outgrowth of delayed deliveries and the desire of buyers to anticipate all deliveries so that they would not run short in the spring selling season. It is known that many mills were asked to ship February and March goods in December, or as fast as they could be made ready. Until the railroads have been cleared up it is going to be very hard for merchants to know just where they stand.

For some weeks past many of the New England mills have tried to check the flood of orders by advancing prices. This method simply whetted the appetities of buyers, as the profits in goods in hand led them to buy still more in anticipation of a further continued rise. Prices are now so high that many manufacturers are imposing very unusual terms on buyers, and are meeting with no resistance to speak of. The shortening of discounts, and terms, and the wider adoption of a delivery at mill policy, have gone on to an extent that no merchant thought they could go when some of these new methods were first instituted. For the time being the sellers have the markets in their own hands.

Since last month there has been a steady rise in prices, culminating in a remarkable advance when goods were opened for fall 1918 delivery. The Amoskeag flannellettes that were opened around 11 cents a yard a year ago were priced at 27½ cents a yard for dark shades, staple ginghams were advanced to 18 cents a yard, staple 8 ounce, tickings were advanced to 37½ cents a yard, Bates dress ginghams and Glenkirk zephyrs were priced at 22½ cents a yard, and other cloths made for fall were lifted to levels that have not been heard of in the present generation.

The curious part of these advances was that buyers demanded as many or more goods than they used last year. None of the mills making fall colored goods had any difficulty in selling their full product at full prices. In fact it became necessary for all mills to cut down orders fully a half, and in some instances more. All mills making domets are now assured of plenty of work throughout the summer and well into the fall. On ginghams the markets remain as strong as ever. The naming of fall prices on such a high plane was expected to lessen the volume of business. It had no effect in that direction as all gingham mills have much more work than before.

The wide sheeting markets have grown stronger and all mills continue fully employed. Pepperall goods were advanced during the month to a basis of 50 cents for 10-4 goods, and other lines in proportion. All drills and brown sheetings continue at very high prices, 21 cents being asked for standard 2.85 yard drills. Most of the mills making goods of this character are working on government orders for khaki uniforms.

Print cloths have reached a level of 9¼ cents for 27 inch 64 x 60's, and 12¼ cents for 38½ inch 64 x 60's. The mills have no stocks on hand and they are sold up for ten weeks to come, some even further. Odd styles and widths have been in demand. Further large Red Cross orders for bandages have been distributed. The wage dispute between Fall River operatives and manufacturers, involving a 2½ per cent increase, is still in the hands of an abritration committee.

Shirting percales for fall were priced during the month on a basis of 16½ cents for 4-4, 64 x 60 goods. Sales were restricted by the inability of printers to take only a moderate amount of new work even at the high prices. Standard prints have been advanced to 13 cents a yard. During the month many printers brought out additional lines of printed ginghams, the most novel of them being a line of double printed staples singed, scoured, and finished by the Arnold Print Works to sell for 15½ cents a yard net. This cloth was in active demand but only limited qauntities could be supplied as the process of finishing is slow and would not be undertaken if staple woven ginghams were not so very scarce and high. The printers of fine wash fabrics are

not getting as much business as usual. Some of them are taking orders for larger quantities than usual of printed flannellettes for the new fall season.

Bleached cottons are firm but have not advanced as sharply as some other goods. Fruit of the Loom 4-4 goods have been advanced ½ cent a yard to 18½ cents. It is one of the noteworthy phases of the market that some of the carded goods are selling higher, bleached, than almost similar weights of combed yarn goods. Certain nainsooks, and lawns, in combed goods have been selling at 13½ cents a yard in 40 inches, while tentered carded goods have sold at 14 cents. The bleacheries are not running in full and are hampered greatly by labor scarcity as well as transportation conditions. Goods coming from the South were held for weeks beyond Norfolk and many were sent north via Charleston. Goods due to the west could not be shipped for days at a time because of railroad embargoes.

During the month some substantial orders were placed in New England on a light weight combed yarn cloth for aeronautical purposes. The goods count 136 x 145 and are made from 75's and 85's combed yarns. They weave very slowly, about 60 to 70 yards per loom per week, and are being ordered in 40 and 43 inch widths. Something like 7,000,000 yards are required.

The set back in the automobile industry has lessened the orders of fine yarn mills in some degree but those that have any spare spinning capacity on very fine numbers can find work on the new aeroplane cloths wanted. The yarn mills engaged on the coarser numbers have an abundance of work.

The fine cloth mills have been getting more business on poplins, gabardines, oxford weaves, and on some lines of shirtings. Silk and cotton goods business has been rather quiet. As a rule the fine goods mills manage to secure work enough to keep their spindles moving but many looms are still idle. It is estimated that as a whole the total output of the New England district in the past two months has been 15 per cent below normal.

While the outlook for business with the mills is quite as good as it was a month ago on any staple or semi-staple cloths, and while government and Red Cross orders continue huge, there is more conservatisim among manufacturers than there has been in a long time. The scarcity of labor through the winter has been growing steadily and if the mills cannot be run full in cold weather, the mill men have little hope of getting a full product in summer. Moreover, the feeling is growing that larger demands for wages will come, and with them there will come a general indolence. There is also a feeling that with prices so inordinately high any shock can bring on great losses and for that reason many manufacturers are insisting that agents shall not sell far ahead.

The very high prices asked for machinery are having the effect of lessening investment and some of the manufacturers are beginning to need work. Roughly speaking, it costs about $45 a spindle to equip a mill that could have been taken care of at $18 a spindle three years ago. This condition precludes any great likelihood of broad activity among the machinery men at present. At the same time, it is stated that there are substantial orders pending for machinery for foreign countries that may attract more attention later.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, January 16th., 1918.

After scoring a further advance of about 3 cents per pound, or $15 per bale since our issue of last month when we still advised buying, the market of late has been less bouyant owing to the severe weather interfering with transportation and industrial activity.

In the future the statistical developments are likely to be less bullish than in the past, for while the crop, including linters, promises to be only about 12,000,000 bales against about 13,000,000 last season, the South has marketed only 7,981,000 bales vs 9,532,000 last season, holding in the interior 4,019,000 compared with 3,468,000 at this time last year or 551,000 more than one year ago.

On the other hand American mill stocks were small, on December 31st 1,577,000, last year 2,366,000, and stocks in public storage were only 3,826,000 vs 4,129,000 one year ago, or a total of only 5,403,000 against 6,496,000, or 1,093,000 bales smaller than last year.

Exports of late have not been up to expectations, so far this season 2,401,000, last season 3,437,000, or 1,036,000 less than to even date last year.

Receipts are now running as large as they were at this time one year ago and will likely run larger than last year's arrivals during the remainder of the season. In consequence stocks at the ports and in the interior are gradually accumulating, and are likely to be nearly as big as they were at the end of January last year.

Under the circumstances the situation, present and prospective, is not so bullish as it was one month ago, and unless there is a revival of the recent urgent demand for spots, prices are likely to seek a lower level, if only temporary, as the price of middling in this market to-day is 31.75, whereas at this time last year it was only 17.75.

The severe cold weather since the holidays, the scarcity of fuel and of labor, North and South, is reflected in returns showing a smaller consumption of cotton in the United States during December than for the corresponding month last season, 517,000 bales vs 537,000, or 20,000 bales less, linters not included, making a total for the first five months of the season only about 2,795,000 vs 2,756,000 for corresponding period last season, or only 39,000 bales more, which is rather disappointing.

The question of fuel throughout the country appears to be a serious proposition, a great shortage reported in all sections of the Union, apparently becoming more acute because of the continuance of cold weather increasing the domestic consumption of coal at a time when factories and the government need it most.

It is probable, therefore, that consumption of cotton will be curtailed further because of the scarcity of fuel, as the weather thus far this month has been more severe throughout the country than it was last month. The effect of the smaller consumption than anticipated has sort of taken the edge off the market for the present.

At last Texas has been favored with some precipitation, light to heavy rains have fallen over the state recently, and snow was quite general there also of late, relieving the drouth conditions. As a result the soil is in better condition

to permit of plowing in preparation for the next crop, but much more rain is needed in Texas to make the outlook satisfactory.

Rains, general and heavy in character, have fallen in the central and eastern portions of the cotton region, placing the land in fit condition for farm work, and it is thought that the recent very low temperatures in the cotton region have destroyed much of insect life, including the weevils, perhaps.

Indications are that there will be a material increase in the cotton acreage this spring, especially in the Southwest, as the price of cotton to-day is about 14 cents per pound higher than it was last year at this time, or $70 per bale higher, which, it is believed, will be the incentive to increase the acreage largely.

Lancashire Notes.

BY AN ENGLISH CORRESPONDENT.

The cotton trade here has had to resign itself to a long period of restricted production. The Board of Trade has stated that it will be "an achievement" if 60 per cent of the spindles are kept running and the Ministry of Shipping can make no promises as to the amount of cotton that will be imported in 1918. We are assured, though, that the War Cabinet has instructed the Shipping Controller to do all he can to keep the importation of 1918 up to the level of the past twelve months, and the latter has a "lively hope" that he will be able to do so. The Government has also vouchsafed the interesting information that the cotton imported during the past year amounted to "almost as much as in the year before the war" and that but for the demand for the making of explosives there would have been no shortage at the mills.

It became evident several weeks back that the Government had no hope of preventing a considerable curtailment of production, and it was announced that a number of aircraft factories would be put in Lancashire in order that unemployed cotton operatives might be found work. Government representatives have been making investigations as to the possibility of converting mills into factories for the construction and assembling of aeroplanes, and have placed a report before the War Cabinet. The nature of the report has not yet been made public; but it is obvious to anyone familiar with the cotton trade, that the conversion of a spinning mill into an aeroplane factory is a biggish business and that in the case of either spinning mills or weaving sheds there would have to be much moving out and moving in of machinery. However, aeroplane factories, as a war relief measure rolled into one, are "on the carpet."

Apart, however, from the inference to be drawn from the aircraft project, the agreement just concluded with reference to wages, alone goes to show that for a *further* six months at least (so far as those in the best position to know can see) restricted production under the Cotton Control Board is to be the rule. When I last wrote, a crisis appeared to be approaching owing to the claims for higher wages which all the operatives had put forward. The spinners wanted 32 per cent, the card and blowing-room operatives 25 per cent, and the operatives in the manufacturing departments 40 per cent. Matters came to a head just at the time when the three months during which the Control Board's restriction scheme was to operate expired. It will be remembered that an important feature of that scheme was the payment by employers of levies, for working even a certain percentage of their machinery, and that the fund so raised was used to maintain operatives thrown out of work by the scheme. This meant the saving of trade union funds, and the operatives' representatives were very anxious that the levy system should be continued. The employers' position was that they could not pay the advances of wages demanded and also pay levies to the Control Board. The upshot was a compromise. The operatives agreed to accept a fifteen per cent advance all-round, and the employers to continue to pay such levies to the Control Board as would permit allowances to be paid at present rates to out-of-work operatives. This, of course, means the continuance of the restricted production scheme, under which the rule now operating is that not more than 60 per cent of spindles or looms is to be run in the case of Government contracts; and in such cases levies have to be paid on the excess. The future levies have been fixed at just half the former rates which seems to indicate that the Board has funds in hand. The new rates are; mule spindles five-eights of a penny per week, ring spindles fifteen-sixteenths of a penny; looms up to 72-inch reed space, 1s.3d. per week, above 72-inch 2s.6d. The agreement, as stated above, makes it clear that it is expected by those at the head of affairs that at least until June next, greatly curtailed production will be necessary, for during that period the rate of wages is to remain unchanged and, in return, the unemployed are to be maintained by the levies. The increase in wages during the war now amounts to 35 per cent all through the trade.

In spite of vicissitudes of the trade during the past twelve months spinners are able to look back over a profitable year. Frederick W. Tattersall, of Manchester, has analyzed the results of fifty companies during the year ending November 30th. All these concerns have made a profit. The total profit of all these mills, after paying interest on loans and allowing for depreciation, amounts to £254,236. This works out at an average profit per company of £5,085 as compared with £4,034 in 1916. The profit on the share capital works out at 13.48 per cent per annum, as against 11.22 last year. The profit on share and loan capital combined is 8.16 per cent as against 7.30 in the previous year. The present total value of the machinery and plant of the fifty mills is £2,103,273, and the spindles in them total 4,587,147. Mr. Tattersall sums up the experience of spinners during the past year as having been "better than in any twelve months since the beginning of the war." "The trade position at the moment," he says, "is more profitable than for many years back."

John Kidger, of Oldham, has published his annual survey of the working of ninety Oldham companies, and it tells a similar story. In spite of irregularity of output and higher working expenses Mr. Kidger states that spinners "have had a surprisingly good year" and that many have to pay or provide for the excess profits duty, imposed as a war measure. In this case 87 companies earned a total profit of £523,813, after allowing for depreciation and interest on loans. Three companies show a loss amounting in the aggregate to £7,293, so that the dividend actually paid averages 7 5/9 against 6 per cent for 1916. The above relates to concerns which publish balance sheets. Mr.

Kidger gives the dividends of 160 companies which do not publish balance as averageing 12⅜ per cent. It must be borne in mind that, under the Excess Profits Duty, the Government takes 80 per cent of all profits which, being more than £200, exceed the average of any two of the three years immediately preceding the war. Mr. Kidger has tabulated the profits and losses for the past 34 years and shows that 25 were good years and nine bad, the profits in the former totalling £7,978,853 and the losses in the latter £921,864. Over the 34 years the average dividend was 5⅓ per cent. In 1907 15⅞ was paid and in 1908 11¾, but from 1892 to 1896, inclusive, the average never rose to 2 per cent.

The Yarn Market.

The yarn market for the past month has been comparatively quiet. The first week of the New Year is never a very active one, coming, as it does, immediately after the holidays and with inventory time just closing. These deterrents to business combined with the congested railway situation and the drastic orders of the Fuel Administrator all tended to decrease the demand. Yarn prices continued high and with the high raw material prices seemed likely to go higher.

Early in the month the combed yarn situation was slow with prices irregular. There were some inquiries for carded yarns on cones for deliveries starting next summer, and there were some numbers of carded weaving yarns for which there was a strong demand for small lots in spot deliveries.

The freight congestion has proven of great benefit to owners of stocks of yarns in the Philadelphia and other consuming markets as spots advanced somewhat in proportion to their scarcity. 20's two-ply warps was one of the numbers that was scarce and while quoted at 53½ cents, in less than a week the price was up to 56 and later to 57 cents for spot delivery.

In the underwear field there was some talk of substituting high grade carded yarns for single combed yarns in 30's and coarser because of the extremely high prices which make it practically impossible for underwear manufacturers to utilize such qualities and market the goods.

A good many inquiries were coming in around the middle of the month for carded yarns on cones, but in many instances the buyers refused to pay the prices asked. For example, one spinner quoted 10's cones for delivery to start in May at 55½ cents. The demand for double carded and high grade yarns to substitute for combed yarns was good during this period and sales of Southern frame spun 30's double carded cones were made at prices ranging from 64 to 66 cents, while 30's mule spun Eastern cones sold from 68 to 70 cents.

As the month closes yarn sales were looking up and deliveries improving slightly. There were some fair sized sales of combed yarns to hosiery manufacturers, but other sections of the market remained quiet. The hosiery people are reported to have plenty of business and it is said that manufacturers can sell the output of their mill up to the end of the year if they care to do so. The largest quantities of combed yarns sold were in numbers under 30's. There were plenty of inquiries for carded yarns on cones, but the spinners did not seem to be disposed to sell for long deliveries. The demand for carded weaving yarns was chiefly for coarse numbers, many for spot delivery.

Following are recent quotations on the Philadelphia market:

Southern Single Skeins.

4s to 8s	50 @50½	10s	50½ @51
12s	51 @51½	14s	51½ @52
16s	52½ @53	20s	54½ @55
24s	55 @55½	26s	55½ @56
30s	57½ @58		

Southern Single Warps.

8s	50½ @51	10s	51 @51½
12s	51½ @52	14s	52 @52½
16s	53 @53½	20s	55 @55½
26s	56 @56½	30s	65 @66
40s	69 @70		

Carpet and Upholstery Yarns in Skeins.

8-4 Slack	50 @50½	9-4 slack	50½ @51
8-3-4 hard twist	50 @50½		

Southern Two-Ply Skeins.

8s	50½ @51	10s	51½ @52
12s	52½ @53	14s	54 @54½
16s	55 @55½	20s	55½ @56
24s	56½ @57	26s	57½ @58
30s	58½ @59	36s	64 @65
40s	72 @73	50s	94 @95
60s	$1.00@$1.05		

Southrn Two-Ply Warps.

8s	51 @51½	10s	52 @52½
12s	54 @54½	14s	54½ @55
16s	55½ @56	20s	57½ @58
24s	58 @58½	26s	58½ @59
30s	60 @60½	40s	73 @74
50s	95 @96		

Northern Two-Ply Carded Peeler Skeins.

20s	58 @59	24s	60 @61
26s	61 @62	36s	74 @75
50s	98 @99		

Two-Ply Combed Peeler Skeins.

20s	68½ @69½	24s	72½ @74½
30s	77½ @79½	40s	85½ @90½
50s	$1.00@$1.05	60s	$1.10@$1.15
70s	$1.30@$1.35	80s	$1.50@$1.55

Southern Frame Spun Carded Yarn on Cones.

8s	53½ @54	10s	54 @54½
12s	54½ @55	14s	55 @55½
16s	56 @56½	18s	56½ @57
20s	57½ @58	22s	58 @58½
24s	58½ @59	26s	60 @60½
30s	63 @64	40s	72 @73
30 tying in	62 @63		

Northern Mule Spun Carded Yarn on Cones.

10s	55 @55½	12s	56 @56½
14s	57 @57½	16s	58 @58½
18s	58½ @59	20s	59 @59½
24s	60½ @61	26s	62 @63
30s	69 @74	40s	77 @79

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	64½ @65	12s	65 @65½
14s	66 @66½	16s	67 @67½
18s	68½ @69	20s	69½ @70
22s	71 @72	26s	75 @76
30s	79 @80	36s	85 @86
40s	88 @90		

War Savings.

Thrift Stamps and War Savings Stamps are the most democratic of investments and America expects every American to show love of republican institutions by investing in this democratic security. The aggregate amount of the investments and the number of investors in these War Savings securities are in a way the answer of the people of this great Democracy to the call of the cause of democracy throughout the world and the vindication of civilization and humanity.

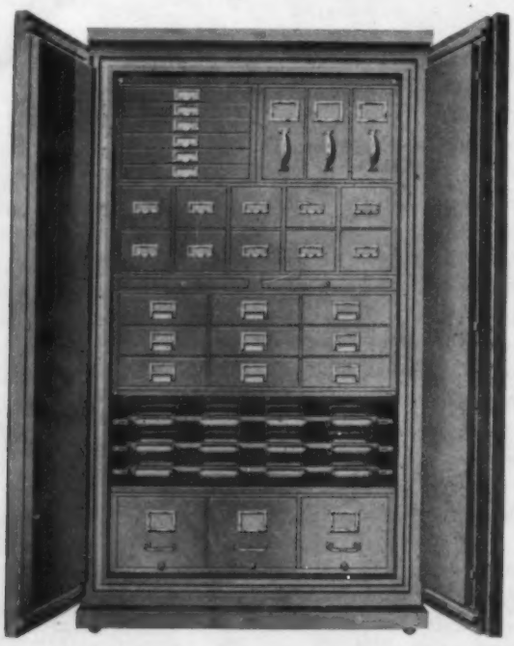
They afford every person, however humble and however small his means, the opportunity to contribute his part, to do his bit, in this great struggle against the military masters of Germany who seek to dominate the world in contempt of justice and right and freedom and without conscience and without mercy.

Surely every American desires to have a part in the defeat of autocracy and the success of liberty and right.

Are Your Business Records Safe?

Are your business records safe? Are you sure? While the average cotton mill is well protected against fire and is thoroughly sprinklered and built of slow burning construction, very frequently the mill office is located in an adjoining building, or sometimes an old dwelling house of frame construction with shingle roof. What would happen if this office burned up?

It is true that the average office contains a safe, but is this safe fireproof? Frequently it looks as strong as the Rock of Gibralter, but it would offer a mighty slight resistance to either a well equipped yeggman or a fairly hot fire. It is possible that you may never have had a fire, but can you afford the risk, particularly at this time when your mill is overcrowded with work, frequently for the Government, and efforts are undoubtedly being made by enemies of our country to destroy factories working on gov-



ernment products, or to in any way possible delay the delivery of such products? Is it not better to prepare for an emergency and secure the peace of mind which an "Allsteel" safe will give?

The Allsteel safe is a most practical and convenient means of housing office records safely and in order. Furthermore, the Underwriters model type is inspected by the Underwriters' Laboratories, Inc. and carries their inspection label. This inspection label certifies to the high degree of heat resistance that this type of Allsteel safe will stand because it has received their approval only after severe tests that were carefully classified. These tests included heat and water greater than would be experienced in the average fire and extended also to a careful examination of design and practical features which insure convenience with protection. After undergoing intense heat for eighty minutes the temperature inside the safe did not reach the maximum allowed by the Underwriters' standard table for a forty-five minutes period. In other words, the protection given by this safe was practically double that specified by the Underwriters' Laboratories.

After eighty minutes exposure to a temperature which finally reached 2020 degrees Fahrenheit, the maximum interior temperature of the safe was only 280 degrees. Inasmuch as paper burns at about 600 degrees F., this shows absolute safety under these conditions. Furthermore, when it is remembered that 2020 degrees F. is greater than the melting point of cast iron, which is seldom reached in the burning of a building, then it is at once realized that valuable papers, contracts and agreements are absolutely secure in an Allsteel safe of this character. These Allsteel safes are made in small sizes for the home and larger sizes for the office, and an interesting illustrated booklet describing the G-F Allsteel safes may be secured by addressing the Southern G-F Company, Atlanta, Ga. It costs nothing to investigate and it may mean thousands of dollars saved in the end.

BOOK REVIEWS

All Books Reviewed Under This Heading May Be Procured From COTTON at the Published Price.

FINDING AND STOPPING WASTE IN MODERN BOILER ROOMS. By Engineers of the Harrison Safety Boiler Works, Philadelphia, Pa.; cloth; 9 inches by 7 inches; pages 276; 213 illustrations; Price $1.00.

The saving of coal is the purpose of this practical handbook, which is addressed to power plant owners, managers, engineers, and firemen. The preface states that such statements, tables, charts, etc., have been selected as were supported by experiments and tests, references being given wherever possible to the original authorities. The latter include many well-known engineers and writers in technical periodicals, also authors of papers before engineering societies, while the excellent bulletins on the utilization of fuel issued during recent years by the United States Bureau of Mines have been freely drawn upon. Pains have been taken to compare statements and to check each source of information against others.

The work is divided into five sections, the first of which is about "Fuels," the second section is on "Combustion," the third section treats of "Heat Absorption"; the fourth section is on "Boiler Efficiency and Boiler Testing"; and the fifth section is on "Boiler Plant Proportioning and Management". The book has been compiled by George H. Gibson, Member American Society Mechanical Engineers, assisted by Percy S. Lyon, now Captain of Coast Artillery. The proofs were read by Henry Kreisinger, who conducted for the U. S. Bureau of Mines of the investigations quoted in the text.

Whatever your requirements may be it is believed you will make no mistake if you will consult the Arabol Mfg. Co., who employ a staff of mill experts capable of handling any branch of the textile industry. State your purpose and they will send either a representative or full particulars which are intended to relieve you of any unnecessary worry and prevent loss of time. They have had over thirty years of experience which is at your disposal. It is their claim that their immense and well equipped plant, together with their knowledge spells uniformity and complete satisfaction.

COTTON MANUFACTURING.

Yarn Mill Organization and Efficiency.

BY S. A. FORD.

INTRODUCTION.

In preparing this series of articles on organization and efficiency in a cotton yarn mill, the writer desires first, to make his position clear. He is not an efficiency engineer, though he has been called by that title and has been offered positions as efficiency engineer on two different occasions. He does not claim, however, to be an efficiency engineer in the fullest sense of the word.

He does claim to be a very firm believer in the principles of efficiency and their application to the manufacture of cotton yarn or cloth. He has derived his beliefs from a course of study of these principles from reading the writings of Taylor, Gantt, Emerson and other efficiency advocates, from conversation and personal contact with successful men who are believers in and students of efficiency. And last but not least, from personal contact and supervision of installation of efficiency methods in a cotton mill during the last few years.

None of the main ideas and principles he will try to bring out can he claim as his own. Many of the adaptations and methods of application are more or less personal, however, though it is probable and possible that others may have adopted similar methods.

He does not expect all readers to agree with him. He hopes they don't. He presents the series for what each reader may consider it worth. If it will cause someone to sit up and think; if it will start a good, healthy, lively discussion among overseers, superintendents, agents and treasurers, either in the pages of COTTON, preferably, or among themselves, the main purpose will have been accomplished.

GENERAL REMARKS.

During the last few years there has been sweeping over this country a new idea and conception of modern business, and the way business should be carried on. This something which has reached into the very vitals of some of our business organizations can best be described by the word *Efficiency*. Linked with the word *Efficiency* are the words *Scientific Management*. They are practically inseparable and yet I have a distinct dislake for the term *Scientific Management*. It has a sort of cold, distant sound about it and through ignorance and misunderstanding the average mill operative has a feeling that anything that comes from scientific management or has to do with scientific management is not for their benefit and instantly arouses their dislike and animosity.

The feeling against efficiency engineering or efficiency management is not so pronounced and I have found employees more amenable to reason under an efficiency campaign than under scientific management.

After all is said, and volumes have been written on the subject, efficiency is nothing but the application to business of good, plain, common sense and the spirit of the square deal.

Some concerns have been quick to recognize the benefits derived from efficiency management, have installed efficiency systems and are reaping the benefits. In other concerns it has been seriously discussed at directors' meetings and discarded as not being applicable to their particular business, even after successful installations in other concerns engaged in the same line.

Speaking in a general way the management of cotton mills as a class were very reticent about taking up efficiency and were one of the last to consider installations. Even today some men do not consider efficiency methods of any benefit. Only a few days ago the superintendent of a large fine goods mill said to me:

"You are working on this efficiency business at your plant, are you not?"

I replied in the affirmative and started to tell him of the success we were having with the installations, which brought a reply something like this:

"Well, that may be all right for some plants that are all run down and have a poor reputation generally, but in a plant such as ours, where everything is kept in repair and goes along smoothly without any trouble, I cannot see where this efficiency stuff can help us any."

I asked him if he knew how much it cost him to manufacture and how he arrived at his cost figures. His reply showed that these cost figures were a combination of a guess and what is known as the average number system of figuring costs. I asked him if he didn't think that the figures might not be more accurately obtained and he replied that they filled the bill as far as he was concerned.

And so it was with the organization, speeds and productions. They satisfied him. His job was not so large but that he could go around the mill and follow each detail. The whole plant represented just this one man's ideas and the best of this one man's experience. He was content to let well enough for him alone. The plant was making money, so why try to improve. They have been doing the same things in the same way year in and year out. It always has been all right, why should it be improved? It would be foolish to try. Such, briefly, was this man's argument.

He was right. Efficiency could not help him in any way. Nothing could help him. Because he did not have to think of improving, of trying to save waste here and there, of trying to change the organization to increase production and lower costs, he considered that no one could improve on his methods and his main reason was that his methods did not need to be improved. He did not need efficiency.

Why have cotton mills been so slow to adopt the gospel of efficiency?

The answer is because they have not really felt that they needed it.

For years cotton manufacturers have enjoyed a high protective tariff. Not only has this protected them from so-called cheaper foreign labor but it has also protected them from their own inefficiency. The tariff had a tendency to stifle any organized effort to increase efficiency within the

mill itself. Manufacturers were content to go along as they had always done and to let the tariff take care of them. If they couldn't make money it was because the tariff wasn't high enough. It was not any fault of the manufacturers or their organization. They had always done things in a certain way and it had not been changed, so it must be the fault of the tariff.

In comparison with other factories (and I make this statement after considerable thought) the cotton mill has not required such skilled technical men in responsible positions and has not attracted such men, nor offered them inducements to enter the field. For years it has been considered necessary for a man to graduate from the school of practical experience before he was capable of taking a position in a cotton mill. Today grave doubts exist as to the necessity of this in the sense that it was considered necessary in past years.

Cotton mill operatives as a class have always enjoyed the reputation of being very low paid. This has tended to keep away the technically trained man who is today gradually taking the responsible positions in the cotton mill. These men are largely graduates of our technical and textile schools.

Another cause for this apparent disregard for efficiency principles lies in the fact that the cotton business is relatively concentrated. By this is meant that the stock passes through a large number of processes under one department. This tends to concentrate the work under a few foremen and has not shown conditions in an unfavorable light. This may be compared with the modern automobile factory where stocks are continuously passing from one department to another, necessitating a vast amount of detail work and the keeping of proper schedules. Here each detail is carefully worked out on efficient principles.

How many readers there are who can call to mind some such case as the following? And this incident is the gospel truth.

Jones (and that isn't his name) was boss carder at the X mills. He was known as a wizard. He had a reputation as being second to none. He always had plenty of help and could get the highest production and best quality of work from a given stock. He commanded a high salary, reputed to the highest for his work in the city. Now Jones was known as a man smart at figures. He could figure a mill from top to bottom and in the terms of the mill "he could not be stuck." If he said a thing was so and so, that was all there was to it. He was a great believer in advertising, and never lost an opportunity to advertise his abilities and show off his command of figures.

Another prominent characteristic Jones had, was that he always carried everything in his head. He took great care that any details of the organization of his room should not become public property. He had no gear books, nor organization charts, nor twist tables. You could not change a gear in his department without going to him to find out what to put on.

Now that job at the X mills was a hard job, as jobs go. It had a bad reputation. The mill management felt this reputation and went out and hired Jones, the best man they could find. They put him into the job and told him to run it and then went and sat down and complimented themselves upon their good luck and good judgment. They had hired the best man they could find. If he couldn't run it, no one could.

Jones hadn't been there long before he fired the old second hand and put his own man on the job. Well, things went along and slight improvements were made here and there. Jones increased his production on paper from 50,000 to 65,000 pounds per week. Help conditions improved and piece workers made more money under Jones than they formerly had.

The spinning room however didn't seem to get any more production than formerly. It couldn't be Jones because he had increased his production 15,000 pounds per week. And still its was funny that the spinning room didn't get more work off. And still this condition didn't cause any undue alarm nor cause any closer attention to detail.

Such was the condition that existed for a few years. The management didn't feel entirely satisfied and still they had done all they could. They had hired the best man they could find.

Then one day Jones threw a bomb into the camp. He gave in his notice. He was going to a better job and could not be induced to stay. Man after man was approached to take the job, but Jones said it was a bad proposition and so they let alone. Jones left for his other job and took his second hand along with him.

Things gradually went from bad to worse, and finally the card room and spinning room went "busted" entirely. No gear or twist charts could be found to tell what gears to use. Jones constantly changed frames to keep up so he said. The superintendent was at his wits end. Finally along came a young fellow 24 years old who had been second hand for about a year and had had three years' experience in a cotton mill. In desperation the superintendent hired him, and to make a long story short, he took the room, reorganized it, showed the superintendent what could be done and could not be done, set standards of production and held the superintendent and his rooms to these standards.

In other words his entire course of procedure was directly opposite to that taken by Jones. Where Jones was very secretive and mysterious in his ways, this young man was very open and broad minded in his attitude. As a result, an organization was gradually built up that proved very efficient, that the overseer made his superintendent as familiar with as he himself was. If that overseer should get through the next day, his room was so organized that it could never get into the condition that existed after Jones left.

And still the superintendent said to this young overseer one day: "Jones got a production of 62,000 to 65,000 pounds per week. You are only getting 55,000 pounds. Why can you not get more?"

The young overseer answered something like this:

"Doesn't it seem funny to you that the spinning room is getting more out of my 55,000 pounds than it did out of Jones' 65,000?"

Oh, the gross inefficiency of a system that allows an overseer to leave a plant and his rooms to become demoralized on that account. No more efficient is a system that allows a new overseer, superintendent or agent to enter a plant and change tried and proven organizations as well as overseers, just to suit his own personal whims and because he has friends for whom to find jobs.

Here is another instance fresh in my memory. A short time ago a friend of mine was called to a small town in an advisory capacity. He was to look over running condi-

tions, organization and cost system with the idea of improving general plant conditions. Such work as this requires considerable time and thought. Conclusions are reached only after complete investigation and cool judgment. The superintendent, however, was an impatient sort of a man and was continually pressing for details and results. After one such session the superintendent was shown that without doubt the spinning costs had been steadily rising during the last two years. On the strength of this fact, without any further thought as to why or the reason for this rise in costs, he immediately discharged the overseer of spinning.

This superintendent exhibited one of the grossest forms of inefficiency. He had no system to tell him month by month what his costs were. He had no right to discharge that overseer just on the fact that his costs had gone up. He did not know that the overseer was to blame for it. He had no system to tell him that.

Does the average cotton mill need efficiency? Yes! As much as the flowers need sunshine.

[In succeeding articles it will be the purpose of this writer to explain just what efficiency is; what it will do; how it operates; and he will try to show how to make your mill just a little more efficient.—Editor.]

The Production of Narrow Fabrics.

BY THOMAS WOODHOUSE.

PART ONE.

The designing and weaving of narrow fabrics forms an extensive industry, and one in which a considerable amount of ingenuity is required. The term "narrow" in relation to textiles is a very elastic term, for the widest fabric made by some forms, and in some particular branches of the textile industry, is very much narrower than the narrowest fabric made in certain other branches. In general, however, all fabrics up to about 18 or 20 inches in width are considered narrow. Most of the cloths referred to in these articles will be under six inches in width, although, for certain reasons, it will probably be necessary to call attention to wider ones.

The particular type of loom in which narrow fabrics are woven depends partly upon the kind of fabric, partly upon the use to which it has to be applied, and partly and mainly, in most cases, upon economic reasons. It is absolutely essential to have perfect or nearly perfect selvages in many fabrics, while in other fabrics imperfect selvages are not detrimental. At the same time, a neat selvage is desirable for all fabrics which are not intended to display a fringe or brush. The selvage is a very important feature in a host of fabrics, and special pains and means are adopted to make it attractive even if it is not intended to form a permanent part of the texture.

Special looms are made in which two or more fabrics are woven side by side at the same time. When it is desired to weave several widths in the same loom, and simultaneously to make perfect selvages on each cloth, it is evident that some type of special loom is necessary. On the other hand, a considerable number of very narrow fabrics are made in ordinary looms, while various modifications of the mechanism in ordinary looms are sometimes effected to produce narrow fabrics with selvages approaching more or less the perfect ones which are made in special looms.

In many instances, several types of narrow fabrics can be made more economically and with less trouble in ordinary looms than when woven in special looms. Inexperienced weavers, and fixers find difficulties in manipulating successfully the complicated mechanism which forms part of most special looms, and when this is the case, the ordinary type of loom may prove to be the more satisfactory. In all cases, the productive capacity of a loom is an important phase, and ordinary looms are often more productive than special ones.

It is a well known fact that it is invariably more economical to weave two narrow fabrics in a wide loom than to weave them in separate narrow looms, and the weaving of a larger number of narrow fabrics in the same loom is simply a development of this economic production.

Narrow woolen fabrics, of various kinds, have been woven in duplicate for several decades, but in the majority of these fabrics, which are usually cut in two lengthwise as the wide fabric emerges from the cutter, cropper or shearer, the inner selvages, although not perfect, are quite

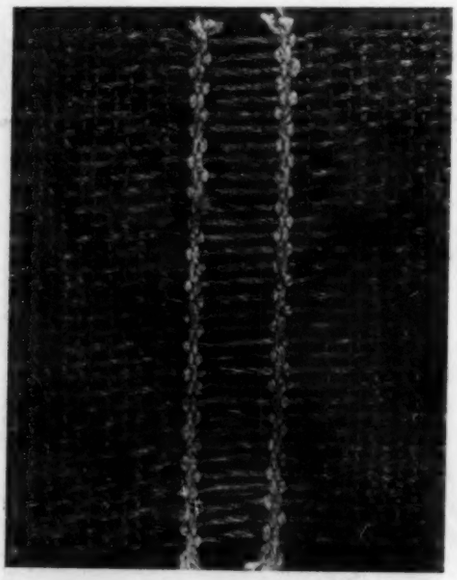


FIG. 1.

satisfactory, because the yarns have been milled or felted, and, in consequence, the warp threads do not fray easily. In no other type of fabric do precisely the same conditions apply; nevertheless, there is an immense amount of cloth made in which the selvages are important only in that they keep the warp threads intact until such times as the cloth is cut up for various purposes.

When the advantages of weaving two narrow fabrics were observed, it was only natural to expect that efforts would be made to apply the principle to other fabrics, and some very ingenous applications have been invented and used with gratifying results. The first method, and one still employed, would probably be that of leaving a few empty dents in the middle of the warp, and the shots of filling would be cut at this place, either after the piece left the loom, or during the operation of weaving. And, although the fabrics so woven may serve their purpose, it is evident that the threads, near where the cutting takes

place, are easily dislodged. We are probably correct in stating that this obvious defect led to the introduction of what is known as the "centre selvage" or "patent selvage".

Figure 1 illustrates the central bit of a 40-inch fabric in which the so-called centre selvages are shown clearly about half an inch apart. The distance between the two selvages may vary slightly. In Fig. 1 there are three cotton threads for each selvage, although in some cases only two threads are used for each; two 20-inch fabrics are thus woven at the same time. A description of these centre selvages and other selvages appears in Jute and Linen Weaving, Mechanism, by T. Woodhouse and T. Milne, p.p 360 to 368, 1st Edition, and p.p. 567 to 577, 2nd Edition (Macmillan & Co., Ltd., London and New York).

Figure 2 illustrates a much better fabric made with double warp. Several of these will have been woven at the same time, since the fabrics illustrated is only 2½ inches wide, and contains a patent selvage at each side, again formed by three cotton threads. Since the extended use of this method enables several fabrics to be woven at the same time, it is obvious that the term "patent selvage" is more appropriate and correct than the term "centre selvage".

When the filling threads which bridge the gap between the two patent selvages, say those in Fig. 1, are cut, each fabric will remain comparatively intact when thus separated,

FIG. 2.

even in very open fabrics such as that illustrated in this figure. The separation of many fabrics is, in some cases, not easily accomplished on account of the flimsy nature of the temporarily combined parts. The fabrics may, with a little difficulty and some danger, be cut in the loom, as already indicated, by means of a series of knives fixed to the inner edge of the breastbeam, by discs or groups of blades rotating continuously or intermittently near the same position, or by specially constructed types of scissors. In every case, however, the several parts of the mechanism must be securely guarded to prevent accidents to weavers and others. On the other hand, the various fabrics in the same piece may be separated after the piece leaves the loom. If the operation at this latter stage is not done by special cutting apparatus, the separation is perhaps most easily performed by a sharp knife during some finishing operation.

Figure 3 illustrates diagrammatically two such narrow fabrics being cut up the centre lengths of filling by a knife. The adjoining fabrics are supposed to have been already separated from the two narrow strips exhibited.

Six fabrics of the type illustrated in Fig. 1, each say 5 inches wide, are often made in the same loom, and, when they are separated, are used extensively for wrapping the tires or other parts of bicycles and motors, for protecting the bark of young trees, and for similar purposes where the protection is for a limited period. Nothing further need be said about this fabric except that the cloth, neglecting the patent selvages, is perfectly plain in structure.

Several patented methods are in use for effecting the crossing of the cotton threads in these patent selvages, but,

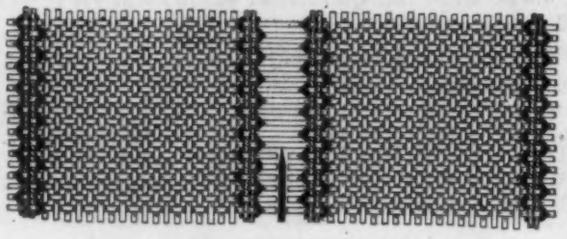


FIG. 3.

as a rule, most of these necessitate apparatus above the healds or harnesses, and such essentials are clearly encumbrances to the weaver, especially when a considerable number of very narrow fabrics have to be made at the same time. Unpatented methods have been devised in which all the apparatus is below the warp threads, and in which any number of selvages can be manipulated. The writer knows cases where 14 separate fabrics are woven in a 36-inch reed space loom by one of these methods.

These ingenious and highly meritorious systems of keeping the warp threads intact by cross weaving on the guage principle are feasible only when the selvages are of secondary importance or of little importance. It is true that, in addition to cutting the filling picks as they were inserted in the loom, the severed ends have been turned into the shed so that the selvages thus formed would not differ sensibly from the ordinary selvages at the two sides of the fabric; but even in this praiseworthy example, it is obvious that the patent selvages thus formed contain more shots of filling than the outside selvages and the remaining parts of the fabrics. And if by this accumulation of filling the selvage happened to be thicker than the remainder of the fabric—and it usually would be—there would probably be some difficulty experienced, not only in the weaving but in the finishing operations. The warp threads at these specially formed selvages may be set further apart than the remainder of the threads, but even then the inner selvage is often inferior to the outside one.

Figure 4 illustrates a narrow fabric, 1¾ inch wide, which has been made in an ordinary loom with the picking motion and shuttle dispensed with. Several of these fabrics are made at the same time, and it will be noticed that there is no fringe or projecting shots of filling on either side. The way in which the pattern has been mounted shows that there is a perfect selvage on the left, but that the selvage on the right differs from it, and is rather thicker. The scheme of weaving practised in this case necessitated

double picks of filling, and, since the warp threads are double, it follows that the actual structure of the cloth is the 4-thread hopsack or basket weave. Four repeats of the real weave appear in the upper part of Fig. 5, the unit weave being developed in solid marks. The connecting

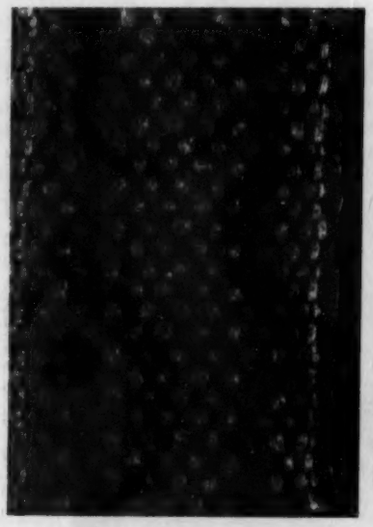


FIG. 4.

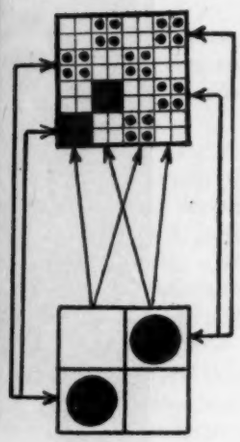


FIG. 5.

lines from the threads and picks to the lower figure show that the weave is equivalent to the ordinary plain weave so far as the mechanical operation of weaving is concerned.

An illustration of the above mentioned loom appears in Fig. 6. It is made by D. J. Macdonald, St. Roque's Works, Dundee, Scotland, and was invented to weave narrow fringes such as that shown in Fig. 7. The unique filling-carriers (not shuttles) are attached to a frame which is operated by means of a strap. One end of this strap is fixed to the loom frame, and the other end is fixed to the breast beam at the opposite end of the loom. The strap is kept parallel to the race by two small pulleys. As the

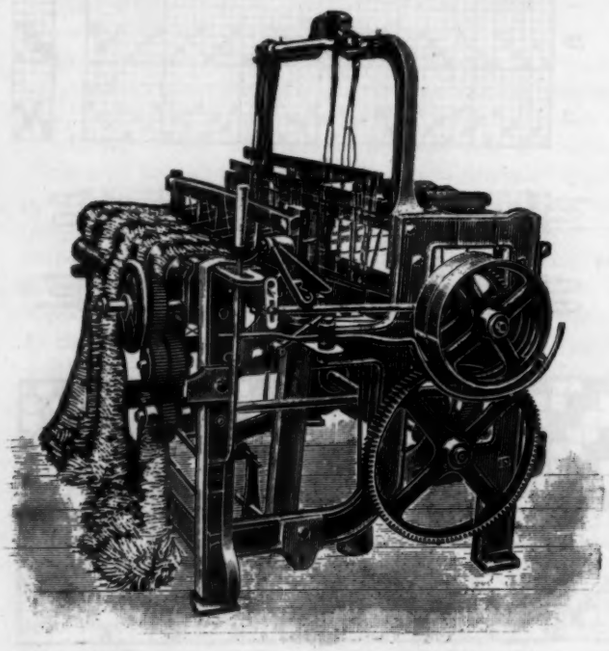


FIG. 6.

lay or race moves towards the back centre, the filling is carried through the shed by the small carrier arms, and the latter are withdrawn as the lay moves towards the front centre. When the arm is through the shed, the filling is caught to make the desired length of fringe, and the eye of the arm slides along the second pick as the former is being withdrawn from the shed. The fringe is cut automatically every revolution. A modification of this loom enables the cloth in Fig. 4 to be woven, and it is evident that several widths can be woven simultaneously.

The ordinary loom is also admirably adapted for weaving fabrics in plain weave or simple designs, and in which a fringe is required on all sides. Thus, small mats of a few inches in width and of various lengths can evidently be made by leaving a gap between each pair of cloths equivalent to the length of the fringe demanded by both, while the outside fringes may be made by a catch band on each side placed at a sufficient distance from the extreme threads of the warp to catch the filling for the fringe. Occasionally a few splits of warp are used instead of a catch band for the same purpose.

While special or patent selvages may obviously be included in such plain cloths, the same provision has not yet

FIG. 7.

been made possible on the remaining two sides of the fabric bordered by the first and last picks of filling. Fringed narrow fabrics, similar in construction to those just mentioned even if only a few inches wide across the fabric itself, require, when woven singly, a reed space of 18 to 20 inches.

All widths of 8 inches and upwards of plain, twilled and fancy cloths can be woven in the ordinary narrow looms, provided that the reed width is sufficiently narrow to allow perfect selvages to be made on each side. In ordinary shuttles, the eye for the filling is near one end of the shuttle, and hence the stretch of filling between the eye and one selvage will be less than the stretch between the same eye and the other selvage when the shuttle reaches the opposite box. While a perfect selvage may be made when the shuttle carries the shorter length through the shed, it is evident that under certain conditions, the longer length of filling at the opposite end cannot be drawn tight, and unless it is drawn tight, a loop will appear near where

the selvage should be. To overcome this defect, the threads of the warp may be, and often are, drawn more to one side of the harnesses and the reed than to the other, that is, nearer to that side of the loom where the shuttle eye travels furthest from the centre of the reed.

Heavy twilled bandage cloths, narrower than 8 inches such as girths for horses, are often woven in this manner in a narrow loom, for such a loom, running at from 200 to 220 picks per minute, will turn out a comparatively large quantity of cloth. Moreover, a weaver can attend a loom weaving such a fabric in addition to watching some other loom of more complex character. It is obvious, however, that if, with the above arrangement, the filling cannot be drawn up to the selvage threads perfectly at both sides of the fabric, the narrow reed space loom must be discarded for one or an other of the special types. As a matter of fact, practically all fabrics under four inches in

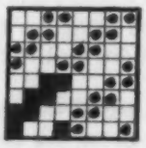


FIG. 8.

width, and in which perfect selvages are required, are made, either separately in a very narrow reed space loom or else in groups, and in both cases in specially constructed looms. Still, no hard and fast rule can be laid down for these cases, for the writer has known to be woven 5-inch bandage cloths in an ordinary crash loom, while it is well known that special looms may weave two or more fabrics at the same time, each with perfect selvages, and each having a width of several inches.

Since there is a great variety of these narrow goods made in all kinds of material, the warp and filling yarns of which may be the same or a different class of yarns, we shall not attempt to keep each class separate, but shall rather attempt to describe them without a strict regard to relative weight, width, weave or material; in general, however, the ascending order of difficulty in regard to structure of design will be maintained.

One of the most common types of heavy narrow cloth is the well known chair webbing which may be any width from one to three inches or even more than three. The simplest and cheapest fabrics in this line are those made entirely from jute yarns and in the plain weave, with say 15 to 20 threads per inch. Chair webbings, however, are mostly made in one or an other of the simple twill weaves—chiefly the 2 up 2 down twill. Four repeats of this weave are shown in Fig. 8, the unit weave being in solid marks. In such cases the twill is obviously straight from selvage to selvage, but, for the sake of variety and appearance, it is usual to turn the draft of the harnesses once or twice in the width of the cloth.

Figure 9 is a 2 3-8 inch webbing cloth in which the twill is twice to left and twice to right, being of course left and right alternately. This fabric contains about 28 threads per inch, and 18 picks per inch. The twill in many of

FIG. 9.

these fabrics twills to the right as far as the centre of the cloth, and then twills to the left to the other selvage as indicated at A, Fig. 10. This design shows that the cloth contained 48 threads including the six selvage threads; the latter are shown in crosses. The cloth from which this design was taken contained 30 threads per inch, and was

(*Continued on page 300.*)

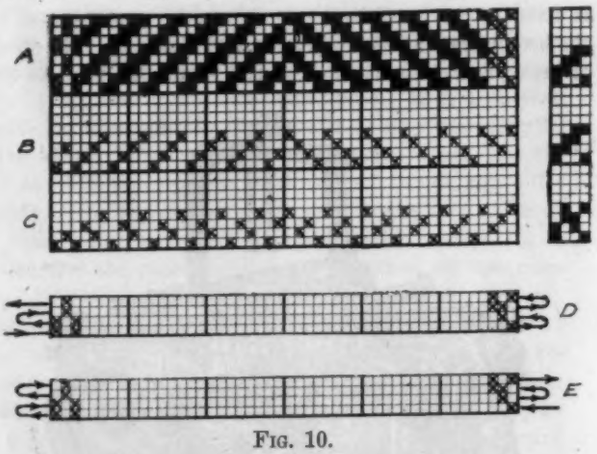


FIG. 10.

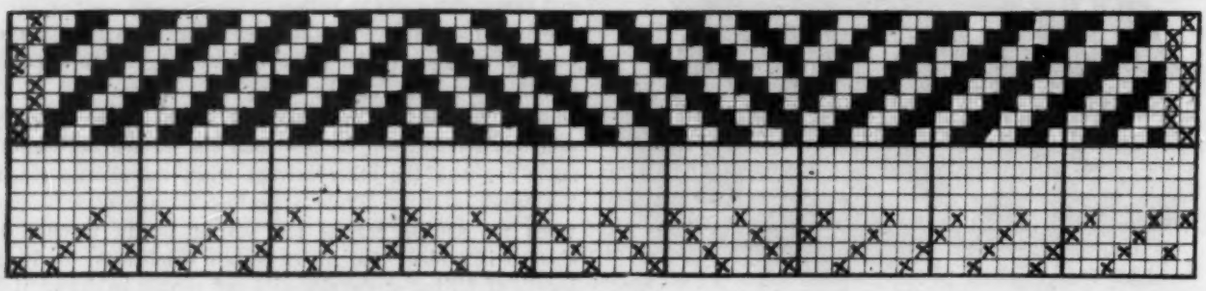


FIG. 11.

Dyeing, Bleaching and Finishing.

Calender Finishing.

BY WILLIAM B. NANSON.

The finish is one of, if not the most imoprtant parts of the manufacture of cotton goods and this is especially true of colored woven goods, or those that have been bleached or dyed in the piece.

The finishing department in a cotton mill making colored goods, or, in a bleachery and dyeworks, is easily the most important department of the mill, for upon it depends almost entirely the sale of the goods. A well executed finish adds a reputation to the products of the mill which materially assists their sale, while a bad finish effectually damns them to a lower grade and renders their sale more difficult.

Finishing cannot be taught in the schools. It takes practical experience; it requires brains; and even more than practical experience and brains, it requires temperament. While nearly all the other processes of the mill or bleachery can be taught in the schools with a more or less measure of success, finishing being in a class to itself, cannot be taught—a finisher, unlike a dyer or a bleacher, must be born and not made; if he hasn't got it in him, i. e., the temperament, no amount of teaching will make a finisher of him and he isn't worth a continental to the mill that hires him.

The finishing of cotton goods is largely a mechanical process, some classes of finish are wholly attained by physical or mechanical means, but others require the assistance of starchy and other finishing materials to give them handle and weight, therefore a wide knowledge of chemicals used in the various processes is absolutely necessary.

In the present paper, however, we shall confine ourselves more particularly to the mechanical finish to be got by various methods of calendering. The process of calendering, consists in subjecting the cloth, when suitably prepared and conditioned, to pressure between revolving rollers or bowls constructed of various materials and at varying degrees of heat and pressure. The effects produced depend also upon the sequence of the nips, and the quality and preparatory treatment of the cloth. With regards to the appearance of the goods the calender gives a closing and flattening of the threads; lustering or glazing; linen or thready appearance; moireing or embossing. With regards to the feel or handle we have the hard and firm or papery feel; the smoothness; elasticity; and smooth, mellow or soft, full, feel.

When goods are passed between a metal and a paper or a cotton bowl at a light pressure a dull and lusterless finish is obtained. The more the pressure is increased the greater the glaze obtained, and with a heated metal bowl still more brilliancy is obtained, and the heat of the bowl drying the cloth gives it a "feel" and a smarter appearance. The goods must be always damped or conditioned before calendering. For glazing or a high degree of finish they require more damping and more heat than for a more simple finish.

With the ordinary calender only a simple finish can be obtained, therefore, for glazing and for some descriptions of moireing, or watering, the calender must be specially arranged to run with a friction nip, this being done by causing the top metal bowl to slip over or travel at a faster surface speed than the goods adhering to the paper or cotton bowl beneath it. More friction is required for a thick fabric than a thin one and the quality of the materials used in starching have a considerable influence on the amount of glaze produced.

When dull finishes without the least luster are desired both bowls of the calender are lapped with slasher cloth. If only one bowl be lapped the side of the cloth next to the lapping will be dull while the side in contact with the bowl will have more or less luster, but, if both bowls are lapped the calendered fabric will be quite dull on both sides.

From all of this it will be inferred that the essential features governing the effects produced at any one particular nip are:

(1) The degree of pressure existing between the bowls, and, to a certain extent, their temperature. This represents the total weight of the bowls lying above the nip, together with the pressure due to the compounded weight levers. This pressure is slightly elastic in virtue of any such quality in the bowls themselves and in so far as the weights are at liberty to move vertically. When "dead set" is applied, by locking the levers and tightening the thrust blocks the remaining elasticity due to the nature of the bowls is almost neutralized, and in any case it is extremely small. This device is chiefly adopted in small and embossing calenders.

(2) The surface properties of the bowls as regards smoothness and elasticity. The bowls being cylindrical, the contact between the bowls and the cloth at the nip is that between straight lines or very narrow areas extending across the face of the cloth. The width of this area is in inverse proportion to the diameter and elasticity of the bowl. The smaller the area, the more concentrated is the application of pressure throughout that surface, or the "keener" is the nip. The smoothness of the finish depends on that of the surfaces of the bowls and the compressing and smoothing effects of a hard, smooth, inelastic bowl are greater than those of a more elastic and softer one. Speaking generally, the impression produced is the outcome of the pressure, the medium and area through which it is applied.

The anlysis of the various forms of mechanical impression due to different forms of bowl and the classification of their effects presents little difficulty, but the capacity of the cloth to receive or retain these impressions is a different matter, for there are so many different conditions affecting these results; there is, for instance, the "condition" or dampness of the cloth, the physical properties of the various ingredients used in the starch, the method by which the cloth had been previously bleached, dyed or otherwise prepared, and the organization of the material as to its strength, elasticity, thickness and compressibility.

It is quite obvious that the dampness or "condition" of the material to be finished, or its filling, must affect the stiffness and vicosity of the starch and the relation of it with the goods themselves, and this in turn must have an immediate effect upon the character of the finish produced. When the material is dry for instance, the pressure of the calender will break the goods down, and make them sleazy and in many cases damage them materially. But the goods may be so conditioned as to become more elastic, in which case they not only regain their original form when the pressure is removed, but actually feel thicker and fuller to the hand.

There are many styles of calenders built for the calendering of cotton piece goods and it is somewhat difficult to classify them, but, in a general way they may be said to be divided into swissing or rolling calenders, friction or glazing calenders, chasing or imitation beetle calenders and embossing calenders of various types.

The essential parts of the calenders are:—the bowls; the frames; the arrangements for exerting the pressure on the bowls; and the driving gears.

THE BOWLS.

Calender bowls are built up of a variety of materials such as cotton, paper, iron, steel and in some cases corn husks. These bowls are usually arranged in such a manner that a metal bowl comes in contact with a "soft" or non-metallic bowl. Metal bowls are run together in paper glazing calenders, but an arrangement like this would not suit for cotton fabrics as it would crush them and make them tender, the nip being too hard and inelastic. For some styles of finishing, as we shall show later, cotton or paper rolls can be run in contact with each other.

It is necessary to give cotton and paper bowls the most careful attention. If this is not done they are liable to be seriously damaged by the mode of working them. New bowls, after running for about a month or six weeks, should be returned to the press to have a further quantity of paper or cotton pressed upon them. This should be done because the heat and pressure to which these bowls are subjected in ordinary working practice, added to the friction in the case of friction calenders, tends to loosen the layers of the paper or cotton and this condition of affairs, if allowed to continue would soon permanently injure the bowls. This addition of new material brings the bowls back to their original size and degree of hardness, and, at the same time protects them from further damage from the same cause. The life of a bowl is very materially lengthened by this treatment. Many finishers are not alive to this kink, and they usually wait until the paper or cotton picks out and the bowl begins to disintegrate before taking it out and having it repressed. These remarks are more especially applicable to paper bowls or cotton and paper bowls when run with friction and excessive heat.

COTTON BOWLS.

Cotton bowls are generally preferred for most finishes on cotton goods. They should be made of pure Egyptian carded cop bottoms. The density or hardness of a cotton bowl is regulated according to the purpose for which it is intended. For instance a bowl for a friction calender requires to be harder than one intended for a calender for giving an imitation beetle finish. It may be set down as a general principle that cotton bowls should not be pressed too hard, otherwise they will get marked up too readily by thick selvages or by heavy creases which may carelessly be allowed to go through the nip. This form of damage is very liable to occur when calendering heavy goods. To avoid the creases at the ends of each roll of goods the calender man should be made to wind the extreme ends of his batch upon the shell, no longer doubled in ends should be tolerated.

PAPER BOWLS.

Paper bowls are made of very highly compressed paper and when they are required for heavy glazing they should be made of thin white or brown linen paper. The finish obtained from these bowls is very hard and papery, and they are consequently suitable for certain classes of work only, such as book back cloths, tracing cloths, hard glazed linings, etc.

Paper bowls are easily marked and the calender man must see that all scrimps, and creases and double selvages are kept out. Also the ends of the bowls must not be allowed to run up, so that the pressure is exerted only on two or three inches of the bowl at each end. This bad feature may be eliminated by often scraping the paper (or cotton) off at the ends for two or three inches or until the metal bowl bears evenly on the cotton or paper bowls all the way across.

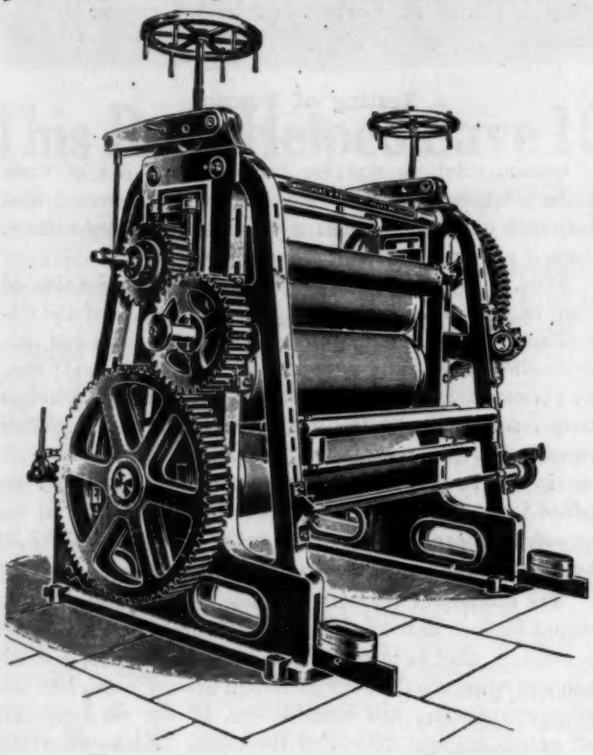
I have in mind some cotton bowls running in a certain mill that have been in use for over fifteen years and have never been skimmed off at the ends since they were set up. When there are no goods running through these bowls, one can see a space between the cotton and metal bowls all the way across except for an inch or two at the ends. When I saw them last the "finisher" was running denims through them (a four bowled calender) they got three nips and by accident, he was getting a very good finish on them for a denim, because the rolls, being high on the ends, barely touched the heavy denims and gave them just the necessary pressure. The calender was put in years ago to finish coarse ginghams, but that mill could not finish ginghams today on those calenders on account of the ends of the bowls being high. I can hear that finisher whisper "well if they finish denims all right and we have denims to run, what's the odds; they are doing the work all right." My reply is that a four or five bowled calender is too heavy and too expensive a machine to use to finish denims, it's a waste of power, and a waste of equipment, and it does not do the work as well, or as conveniently, or as expeditiously as a light breaking calender composed of one metal and two hard wood bowls would do it.

THE PRESSURE ARRANGEMENTS.

The pressure on the calender bowls may be obtained by a dead set or by means of compound levers and weights. In some cases, is in Schreinering calenders, hydraulic pressure is advantageous because by this method and by the aid of a pressure gauge the pressure can be kept uniform, which is important with this class of work. A dead set pressure is usually used on friction calenders and some styles of swissing and embossing; while compound levers and weights are always preferable for calenders containing four or more bowls. Even these latter calenders should be so arranged as to work as dead set calenders when so required, this can be accomplished by locking the levers by means of dead set pins.

Let us say here, that some builders are building calenders with one set wheel at one side of the calender, this wheel which works the set on both sides of the calender by means of a cross shaft, the idea being to ensure an equal

set on both sides of the calender without leaving anything to chance or the intelligence of the calender man; this looks good in theory, but does not work well in practice, for, as every calender man knows, to finish goods right it may be found necessary to work one side of the calender with a slightly different pressure than the other. If he finds that one side of his cloth is coming out softer than the other, he wants to be able to put on more weight on that side, if the goods are damper on one side, or if the calender is hotter on one end, or lots of other things may happen to cause him to wish to adjust his set one side heavier than the other. With both sets going down together as they do with a side wheel, no adjustment is possible and the improvement becomes a nuisance.



A HEAVY THREE BOWL FRICTION CALENDER.

CALENDER FRAMES.

All calender frames should be built twice as heavy as seems needful and then some more, so as to carry the heaviest loads without any vibration. It is impossible, for instance, to get a good finish on a friction or embossing calender where there is any vibration; for this reason all heavy calenders should be on the ground floor and set on concrete foundations.

Calenders should be so constructed that the bowls can be easily taken out, through gaps in the frames, for repairs and all bearings and side plates so arranged that they can be easily lubricated and replaced as they become worn. Calenders have to work under heavy loads and at great speeds and the matter of lubrication is of the first importance. Again, a worn side plate will throw a whole stack of rolls out of plumb, which, besides increasing enormously the power required to turn them will result in the spoiling of the finish and possibly the damage of the goods.

THE DRIVING GEAR.

All heavy calenders should be driven directly from the main line of shafting or by means of a direct engine

YOU can easily flood dingy, light-absorbing factory walls and ceilings with

The Paint that Sparkles O'er With Light

CHAFFEE'S Mill White

More Light
Lowest Ultimate Cost
Permanent Finish

This paint has proven its efficiency in the leading textile mills everywhere. May we have an opportunity to prove it to you?

Write for Descriptive Booklet and Paint Panel.

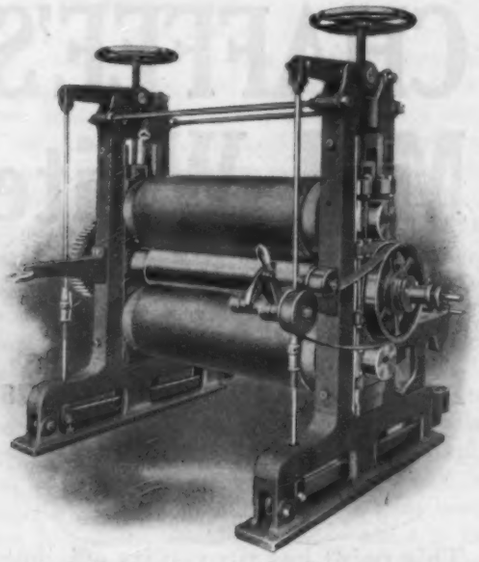
THOMAS K. CHAFFEE CO.

Providence, R. I.

of the double cylinder type or by means of an electric motor. It is false economy to try and run a heavy calender of any type by means of an inadequate clutch. If the power is inadequate, the set must be light or the calender will not run, belts slip, etc., this means more runs and a poor finish, it also means uncertain results and a loss of time.

In friction calenders the bottom bowl is of close grained cast iron and geared with top or friction bowl, which should be gas heated and made of chilled iron. These two bowls are geared together to run at different peripheral speeds. The speed of the upper chilled iron bowl exceeds that of the lower iron bowl by amounts varying from 50 to 300 per cent according to finish required and the style of goods being run (see illustration). The goods travel at the speed of the two lower bowls, and the top bowl or hot friction bowl is the one which glazes the goods by its heat, pressure and friction.

There are many ways of arranging the bowls in friction calenders to obtain various results, but the one given is the almost universal way. In friction calenders, the inter-



A THREE ROLL PLAIN CALENDER.

mediate or stud gear can be taken out of gear so that the calender can be run as a friction or as a plain rolling swissing calender, for this reason, it is a good plan, in small plants where one calender will do all the work, to install a friction calender with or without one extra cotton bowl on the top, this machine can then be run either as a friction calender or as a four-roll swissing and chasing calender. An iron "Stanley" or lubricating bar or roller, covered with cloth is fitted to run against the top friction bowl, this to keep the bowl clean and to distribute wax when required. Also a set of small chasing rollers or bars (I prefer bars) are applied so that the calender can be used for chasing, moireing or for linen and other imitation beetle finishes, all of which are very convenient when limited quantities of goods have to receive a variety of finishes.

A three bowl calender (see illustration) is used for the finishing of all descriptions of simple finishes of white shirtings, piques, dyed, printed or colored woven cotton goods, it gives an agreeable, soft, smooth feel to the cloth. The middle, chilled iron bowl is the driving bowl, this is highly polished and heated with steam. The upper and bottom bowls may be of cotton or husk, or paper, but paper is hardly worth while for this calender. It can also be fitted up for chasing and arranged in this way would give an extra nice finish on colored shirtings. I have seen a calender of this description with the friction clutch to drive it applied directly on to the end of the iron bowl, this does not work well because it makes it almost impossible to maintain an even set on the calender with it, and one selvage of the cloth will be finished heavier than the other.

All calenders when at rest should have the bowls lifted clear of each other by suitable stirrups, otherwise they will be pressed and burnt into furrows or ridges.

[This is one of a series of articles on finishing that this author is writing for COTTON. Others will appear later,—Editor.]

Testing of Sumac.

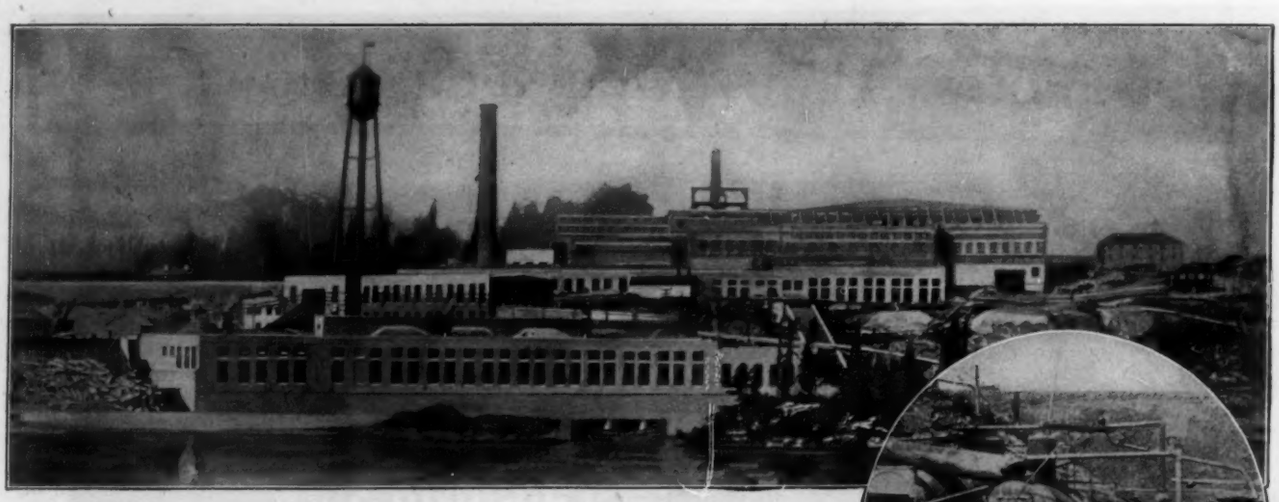
Certain solutions must be prepared, and one of these is the solution of pure tannic acid made to contain one-tenth per cent tannin; also a solution of Indigo extract, about 3 per cent of indigo paste in water.

First, it is necessary to ascertain the relative value of these two solutions, in order to do this, 20 c.c. of the Indigo are put into a white porcelain dish with about one liter of distilled water, with a few drops of sulfuric acid; then the permanganate of potash solution is run into this indigo extract solution until the liquid turns pale yellow. This operation is now repeated with 10 or 20 c.c. of the pure tannic acid as prepared above; upon deducting the c.c. obtained in the first experiment from the c.c. obtained in the second, the quantity necessary for the oxydation of the 20 c.c. of the solution of tannic acid is obtained.

The relation of the permanganate to the indigo solution should be such that about an equal number of c.c. of each is required, that is to say, the process works to its best advantage when about 20 c.c of indigo extract require 20 c.c. of permanagante, and when 10 c.c. of the permanganate of potash requires 10 c.c. of the tannic acid as described.

About 5 grams of the sumac extract under examination is weighed out, dissolved in pure water, and raised to one liter. Then 20 c.c. of the indigo extract solution is poured into the white porcelain dish along with a few drops of strong sulfuric acid, with 30 c.c. of the solution of sumac extract, and the whole is raised to one liter. Then the permanganate of potash solution is run in from a burette until decolorization is effected. For example 10 c.c. of the solution of permanganate of potash corresponds to 20 milligrams of pure tannic acid; 20 c.c. of the indigo solution are decolorized by 20 c.c. of permanganate of potash solution. Five grams of sumac extract have been dissolved, as it has been said, in one liter of water; 30 c.c. of this solution of indigo has required, we will say, 40 c.c. of permanganate of potash to decolorize it; therefore, as 20 c.c. of indigo solution are decolorized by 20 c.c. of permanganate of potash, the remaining 20 c.c. (40 less 20) of the decolorizing solution has been necessary for the oxydation of the tannic acid in the sumac extract.

To get any real work done—be there yourself.—*Cotton-yarns.*



This Roof Helped Save 1600 Lives!

In the summer of 1916 a terrific fire swept 650 square miles of Ontario forests. It wiped out whole villages, bringing death and terror to thousands of people.

At Iroquois Falls the population of the town took refuge in the plant of the Abitibi Pulp & Paper Company, a modern building of reinforced concrete with steel window-sashes and a Barrett Specification Roof.

The building was wrapped in smoke and flame. The air was literally afire. Thousands of cords of wood in the adjacent yards blazed in the fierce sixty-mile-an-hour wind.

For nine hours they cowered there with windows and doors locked air-tight and fire-hose and sprinklers working, while the fire raged about them.

The insurance inspectors who arrived four days later stated in their official report that *the mill-buildings were brought through undamaged.*

The roof was in good condition and is still on duty. It made an ideal, fire-proof, non-inflammable fire-blanket. Embers that fell upon it made the pitch soften and smoke but did not ignite it.

Surely this is proof positive that Barrett Specification Roofs have great fire-resisting properties.

But that is only *one* of their many points of superiority. Barrett Specification Roofs cost less per year of service than any other permanent roof; they cost nothing to maintain; they take the base rate of insurance and, further, they are guaranteed for twenty years as follows:

A copy of The Barrett 20-Year Specification, with roofing diagrams, sent free on request

The photos above, taken after the great fire had passed through Iroquois Falls, give some idea of the terrific heat all around the Abitibi Pulp & Paper Co. plant. Note the bent and twisted steel rails and frame-work.

Roofing Contrs.—Metal Shingle & Siding Co., Montrea
Engineer—George F. Hardy, New York City
General Contrs.—Morrow & Beatty, Ltd., Peterboro, Ont.

20-Year Guaranty

We are now prepared to give a 20-Year Surety Bond Guaranty on every Barrett Specification Roof of fifty squares and over in all towns in the United States and Canada of 25,000 population and more, *and in smaller places where our Inspection Service is available.*

This Surety Bond will be issued by the United States Fidelity and Guaranty Company of Baltimore and will be furnished by us *without charge.* Our only requirements are that the roofing contractor shall be approved by us, and that The Barrett Specification dated May 1, 1916, shall be strictly followed.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria
THE BARRETT COMPANY, LIMITED: Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.

TRADE B MARK

Barrett Specification Roofs Resist Fire

Notes About Men You Know.

LEFT TO RIGHT: ALFRED H. THATCHER AND ARTHUR W. HOOD OF THE STANDARD PROCESSING COMPANY.

ALFRED H. THATCHER, treasurer of the Standard Processing Co., Chattanooga, Tenn., left for the training camp at Yaphank, Long Island, early in January. W. H. Thatcher, who has been connected with the Philadelphia offices of the mill, will go from there to the mill to assume the duties of treasurer office during the absence of A. H. Thatcher. The selling end will be taken care of by A. G. Thatcher and Arthur W. Hood at Philadelphia.

JOHN W. WOODWARD, formerly with the American Thread Company of Holyoke, Mass., has accepted a position as overseer of carding with the Pacific Mills at Lawrence, Mass.

HAROLD W. O'LEARY, recently manager of the cotton yarn department of G. Robinson & Company, New York, and for the past fifteen years identified with the trade in New York and New England, has announced that he has established offices for his own account at 201 Devonshire Street, Boston, Mass., and will represent domestic spinners of cotton yarns.

HOWARD T. WESTERMAN, connected with the office of George H. McFadden & Brother, Philadelphia, Pa., cotton merchants, is now stationed at Camp Meade as supply sergeant of Company D, 304th Engineers. Sergeant Westerman is the son of William T. Westerman, of the Ontario Spinning Company, Philadelphia, Pa., widely known throughout the industry.

HUGH GRAHAM, prominent citizen, bank official and president and treasurer of the American Soap & Washo'ine Co. Cohoes, N. Y. died at his residence in Cohoes on Dec. 23rd.

Z. F. WRIGHT, president of the Newberry (S. C.) Cotton Mills has been re-elected mayor of Newberry for his third term. He had no opposition.

H. J. TRIMBACH, overseer of dyeing at the Stonewall (Miss.) Cotton Mills for the past two years, has resigned to accept a similar position with the Meritas Mills at Columbus, Ga.

LEON CLARK, for the last year overseer of the dyeing department of the Lonsdale (R. I.) Bleachery, severed his connection with the company recently and later became associated with the Garner Print Works & Bleachery, Wappingers Falls, N. Y., in a similar capacity.

EDWARD WILSON of Sydney, N. Y., has been appointed overseer of the dyeing department of the Lonsdale (R. I.) Bleachery, succeeding Leon Clark, resigned.

HENRY D. MARTIN, for some time past agent at the plant of the Selma (Ala.) Mfg. Co., has resigned this position to accept a similar position with a large Eastern mill.

W. D. CRAWFORD has accepted a position in charge of the tire fabric weaving for the Jencks Spinning Co., Pawtucket, R. I. He comes from Voluntown, Conn.

CHAS. A. PONDER, who died at Cowpens, S. C. Dec. 30, 1917, was one of the pioneer textile men of the South, having learned the business in one of the first cotton mills that was erected in North Carolina. He built one of the first successful mills in Texas, and through his efforts the textile industry of Texas received its first demonstration of a successfully operated textile plant. At the time of his demise he was superintendent of the Cowpens Mfg. Co., Cowpens, S. C., a position that he has held through a period of fifteen years, having been called back to this position three times during that period. He leaves a widow and seven children.

C. E. DAVIS has resigned as overseer of spinning at the Columbus Mfg. Co., Columbus, Ga., to accept a position as superintendent of the Atlanta Woolen Mill, cotton department, Atlanta, Ga.

J. P. ABNEY of Ninety-Six, S. C., has succeeded A. F. McKissick as president and treasurer of the Ninety-Six Cotton Mill.

J. E. WILLIAMSON, formerly manager of the Fort Mill (S. C.) Mfg. Co. No. 1 and No. 2, has accepted a similar position with the Brown Mfg. Co., Concord, N. C.

W. W. CRENSHAW has been promoted from overseer of carding to superintendent of the Wymojo Mills, Rock Hill, S. C.

S. B. SHIPP, superintendent of the Shaw Cotton Mills, Weldon, N. C., has been appointed general superintendent of the Shaw Cotton Mill and the Weldon Cotton Mfg. Company, both of Weldon, N. C.

A. B. SAUNDERS, formerly superintendent of the Highland Park Mills, No. 3, Charlotte, N. C., has accepteed a similar position with the Springstein Mil's, Chester, S. C.

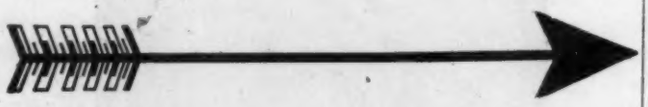
L. O. BUNTON, of Greer S. C., has accepted position as superintendent of the Fidelity Mill, Charlotte, N. C.

PHILLIP S. TULEY, president of the Louisville (Ky.) Cotton Mills, was re-elected president of the Kentucky Manufacturers' Association at the latter's annual meeting recently held in Louisville.

J. A. ADAMS has resigned as superintendent of the Springstein Mills, Chester, S. C., and will, hereafter, devote all of his time to the Eureka Mills of the same place.

S. J. WEBB, formerly superintendent of the Lumberton (N. C.) Cotton Mills, has accepted a similar position at the Statesville (N. C.) Cotton Mills.

The quickest way to lose a fortune today is to have a fire.
Building materials in the past year have taken a terrific jump in price.
An insurance policy which last year amply protected you, today scarcely covers two-thirds the cost of rebuilding your plant, warehouse or shipyard. And insurance rates are climbing.
War is on. Incendiaries are loose. Norfolk, Va., is a woeful example of what they can do.
The best answer ever found to the cotton fire problem is Pyrene. Thousands of mills can thank their existence to the Pyrene Extinguisher. Are there Pyrenes in your mill? If so, are there enough?—1 to every 1000 square feet? Be sure of this!



"Casper, Wyo.,
Nov. 26, 1917.

Leidecker Tool Co.,
Marietta, Ohio (Home Office)

Just saved entire plant from fire with Pyrene Fire Extinguishers. Express us twenty-four re-charges for same.

LEIDECKER TOOL CO. (Factory)"

And have you other Pyrene fire weapons such as Soda and Acid Extinguishers, Chemical Engines and Fire Hose?

Today is the day to prepare. Next week may find your factory in ashes.

Pyrene Manufacturing Company
52 Vanderbilt Ave., New York City
Every Appliance for Fire Protection.

JOHN L. DABBS, southern manager for The National Aniline and Chemical Company, one of the largest dyestuffs concerns in the world, has for a number of years maintained Southern headquarters in Charlotte. Realizing the need of warehouses located nearer the Southern mills he recently decided to open up Southern warehouses in Charlotte. He now has his entire force housed in the new quarters at 236 W. First street, where his company is using four floors and has on hand a large stock of dyestuffs with four or five more cars enroute. In addition to the space given over to the storage of dyes this space includes a handsome suite of offices embracing six large rooms.

G. R. HOOPER has resigned as superintendent of the Highland Cotton Mills, High Point, N. C.

M. D. HANEY has resigned as superintendent of the Wymojo Mills, Rock Hill, S. C., to accept a similar position with the Fort Mill Mfg. Co. No. 2.

LINDSAY S. HALL, overseer of the weaving department for the B. B. & R. Knight Mills, at Manchaug, Mass., has resigned his position with the company. He has been in their employ for the past eight years. He accepted a similar position with the Pepperell Manufacturing Co., Biddeford, Me.

ANDREW S. WEBB has succeeded J. Fred Houston as president of the Necronsett Mills, Cumberland, N. C.

G. V. MCCOMBS has resigned as overseer of weaving at the Lockhart Mills, Lockhart, S. C., to become overseer of weaving, beaming and cloth room in the new tire fabric mill at the Winnsboro Cotton Mills, Winnsboro, S. C.

W. G. BROADFOOT, formerly superintendent of the Brown Mills, Concord, N. C., is now proprietor of the Kilson Hosiery Mills, at Connelly Springs, N. C.

C. R. BRUMBY, JR., has become superintendent of the Standard Cotton Mills, Cedartown, Ga.

ADELARD DECELLES, assistant foreman of the bleachery of the Manville (R. I.) Mill for the last five years resigned, to become associated in a similar capacity with the bleachery at Saylesville, R. I.

WM. R. MCELVEEN, superintendent of John P. King Mills, Augusta, Ga., had the misfortune to lose his Oakland touring car by fire recently. He was out in the country near Augusta gathering evergreens for Christmas decorations, when all of a sudden fire enveloped his car, totally destroying it.

J. H. GIBSON, from the Lavonia (Ga.) Cotton Mill has accepted position as superintendent of the Beverly Cotton Mills, at Middleton, Ga.

B. C. ROBERTS has accepted position as superintendent of the Manchester Mfg. Co. at Macon, Ga.

C. W. MCNEALY, superintendent of the Fort Mill (S. C.) Mfg. Co. will hereafter devote all of his time to Mill No. 1.

J. W. KANNEER has resigned as superintendent of the Statesville (N. C.) Cotton Mills to accept a similar position at the Highland Cotton Mills, High Point, N. C.

T. J. LILLARD, formerly of the Jewell Mills, Thomasville, N. C., will be local manager of the Arrow Mills (formerly Rhyne's Mill) at Lincolnton, N. C.

J. W. GOODROE has succeeded W. R Moody as superintendent of the Payne Mills at Macon, Ga.

THOMAS C. MORIARTY, for the last four years overseer of weaving at the Royal Mills, B. B. & R. Knight, Riverpoint, R. I., has resigned to become superintendent of the Crosvenor Dale Co., North Grosvenordale, Conn.

PRESTON NEWELL has become superintendent of the John M. Stone Cotton Mills at Starkeville, Miss.

S. L. HAYES is superintendent of the Lanett Bleachery & Dye Works, Lanett, Ala.

J. B. DUAL has resigned as timekeeper at Aragon (Ga.) Mills and accepted position as assistant superintendent of Fulton Bag Mill No. 2, Atlanta, Ga.

W. B. MUNNS has succeeded T. A Jones as superintendent of the Regal Hosiery Mills, Cameron, N. C.

PATRICK T. WALSH, assistant overseer of weaving at the B. B. & R. Knight Royal Mills, Riverpoint, R. I., has been made overseer of that department to succeed Thomas C. Moriarty, resigned

A. R. HOOVER has succeed J. B. Morris as superintendent of the G. H. Y. Hosiery Mills at Concord, N. C.

J. E. WILLIAMS has accepted position as superintendent of Defiance Sock Mills, Charlotte, N C.

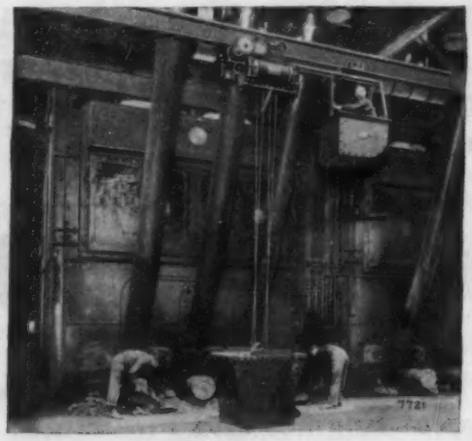
A. E. HORN has accepted position as superintendent of the High Shoals (Ga.) Mills.

Hoists for Handling Ashes.

BY JAMES MONROE, LINK-BELT COMPANY.
PHILADELPHIA, PA.

When up-to-date boiler houses are designed, the problem of handling the ashes is always considered. When we recall that a few years ago, in most cases, the ashes were almost allowed to take care of themselves, it is evident that the designing of machinery to handle them in old boiler houses is quite a proposition. It is one that should be viewed from a number of different angles.

The scheme to be finally adopted, must first and foremost save labor; its first cost must be low, and maintenance low. No one cares to put very much money into



an old boiler house. Then a system should never entail a lot of changes in the old building, with the consequent expense.

A mono-rail electric hoist, with a bottom dumping bucket lends itself readily to such installations. This is especially true where the ashes are pulled out on the boiler room floor, which is so often the case. The Philadelphia Paper Company of Manayunk, Philadelphia, have obtained excellent results with a hoist of this type.

This machine runs on the lower flange of an I-beam track. It is operated by a man traveling in a trailer

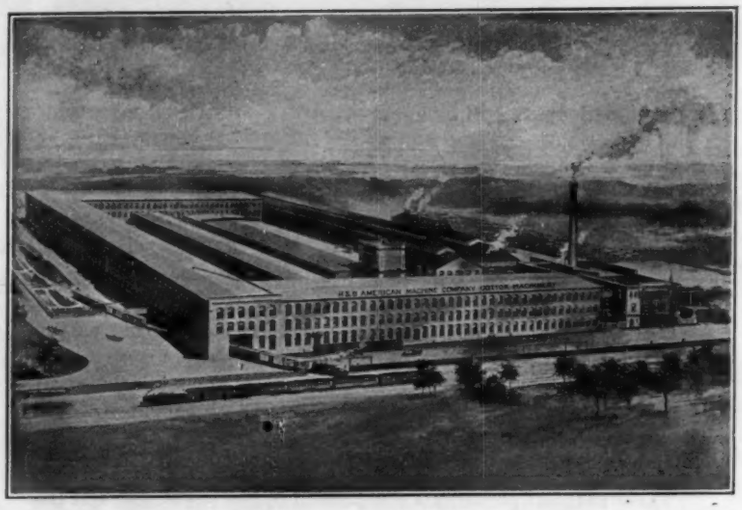
C. E. RILEY, Pres.
Boston Office
161 Devonshire Street

Southern Offices
814-815 Empire Bldg.
Atlanta, Ga.

COTTON MACHINERY

Opening and Picking Machinery

Card Room Machinery



Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

H. & B. AMERICAN MACHINE COMPANY
PAWTUCKET, R. I.

cage, who controls the raising or lowering of the bucket, as well as the travel of the hoist. The illustration shows the machine in the boiler house, through which the track runs, and continues on out over a railroad siding.

The laborers who clean the fires, fill the bucket with ashes; the operator then hoists his bucket, and runs it out directly over the car, where he dumps it, by the motion of a lever in the cage. The current required is very small. Compare this method with that of wheeling ashes, and note the saving in time and labor.

In this instance about thirty tons of ashes are handled daily. They are pulled out every six hours. Two men do the work of shoveling into the bucket, and then often one of them gets into the cage and runs it out over the car; at other times, to hurry the work, an additional man operates the hoist, remaining in the cage. The bucket holds 1¼ cubic yards, and is handled by a two-ton hoist.

This machine is very compact and requires little headroom—a most important consideration in an installation of this kind, where it is necessary to get a large bucket over the side of a high side gondola car. All the gears operate in oil, and are entirely enclosed in housing.

This problem of handling ashes mechanically is daily becoming more urgent. Many boiler rooms are now running twenty-four hours a day where two years ago they were running ten; hence over twice the ashes to handle, and labor scarce. Many plants have put in stokers and forced draft systems, to increase their capacity, often neglecting to provide for the handling of the ashes, when the remodeling is done. The electric hoist fills a long-felt want in this field.

"Graphite for the Boiler" is a booklet published by The Joseph Dixon Crucible Compnay, Jersey City, N. J. that tells in a clear and concise manner why Dixon's Pioneer boiler graphite is one of the most satisfactory remedies for that ever-present boiler scale problem. It deals with the reason why boiler graphite should be used, the method by which it is applied, and contains testimonials as to the results that are being obtained. Dixon's Pioneer boiler graphite has reduced the cost of cleaning 70 per cent in many plants. Write for this booklet.

The well known and established yarn house of A. D. Salkeld & Bro., Inc., changes its name to the Carver-Beaver Yarn Co., Inc.. and increases capital stock to 750 shares of Preferred stock, par value $100, and 2,000 shares of Common stock. A. D. Salkeld retired from A. D. Salkeld & Bro., Inc. in 1913 and the firm since that time has been conducted by W. J. Carver, treasurer and Frederic Beaver, secretary and it is understood the business has been very successful. Mr. Carver will be president and Mr. Beaver treasurer of the new company.

Jacques Wolf & Company recently announced the retirement from active participation in the business of President Jacques Wolf and Treasurer Alfred Fischesser. This same communication also announced the election of the following new officers: President and Treasurer, Dr. Alfred Pfister; Vice President, Andrew Martin; and Secretary and Assistant Treasurer, S. E. Tylee, Jr. The firm will continue to be operated under the same firm name of Jacques Wolf & Company.

Strangling the Periodicals

Congress at its last session passed a hasty postal law increasing the postage on periodicals from FIFTY TO NINE HUNDRED PER CENT.

Some periodicals will be killed—all will be restricted in circulation and crippled. There will be fewer readers, and the habit of reading curtailed. The great function of periodicals is to assist in the spread of ideas—by printing the achievements in the world of thought, culture, and science.

Thus to shut out farm journals—as these zone rates will—will lessen the productive power of our country by millions of dollars through loss of better methods. Shut off trade journals and you decrease the manufacturing power by more millions. Shut off the religious papers and there are shut off channels that have raised millions of dollars for distressed humanity. Shut off the great periodicals of the home and there is throttled an avenue that has given expert instructions to hundreds of thousands of mothers and saved their babies to health and citizenship.

These national periodicals are printed in the big cities—and the first zone, the cheapest zone, is in or near those cities; there are many educational opportunities near cities, and the cities will read anyway. Small towns and distant districts depend to a large extent upon periodicals; thus this law increasing periodical postage where it is most needed shuts off opportunity where needed. It penalizes periodical readers.

Repeal this law. Repeal this FIFTY TO NINE HUNDRED PER CENT periodical postage increase. Sign the petition below and mail it. Put a cross mark in the square—save the periodicals and the work that they have done and are doing for national education and patriotism.

SIGN BELOW

CUT OUT. MAIL TO CHARLES JOHNSON POST, Room 1417, 200 FIFTH AVENUE, NEW YORK CITY

PETITION TO CONGRESS—Sign Here

The spread of education, of culture, of scientific knowledge and advancement, and of our vast internal merchandising and manufacturing has been, and always is, vitally dependent upon the freest and cheapest circulation of periodicals. The penalties resulting from any restriction on the freest possible circulation of periodicals will be destructive of the best interests of our economic life and the opportunities of developing our best citizenship.

The postal amendment passed by the last Congress increasing the postage on periodicals from FIFTY TO NINE HUNDRED PER CENT will throttle or destroy our periodicals at a time when the widest and most extensive circulation of publications is essential to the patriotism, education, and upbuilding of our country.

Therefore, I the undersigned, do most earnestly demand the repeal of this burdensome periodical postage amendment.

Name .....

City or County.....

Street Address.....

State .....

Periodicals mean much in your life. If you will help by a few arguments with your acquaintances and an occasional letter in a spare moment, put a cross mark here.

☛ **Will you help in securing the repeal of this iniquitous law?** ☐

CUT OUT. MAIL TO CHARLES JOHNSON POST, Room 1417, 200 FIFTH AVENUE, NEW YORK CITY

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

Bobbin Building.

EDITOR COTTON:

Bobbin building is one of the points generally overlooked by many overseers and superintendents. We also read very little or nothing about the importance of building good bobbins. Writers for the "How Other Men Manage", and other departments of the different textile journals have more than neglected this all important point.

If this matter can be emphasized sufficiently strong to make even one overseer or superintendent "take notice" the writer will be well satisfied with the effort he has put forth in trying to help remedy one of the largest *little things* in the mill. There are many men who will be able to save their company thousands of dollars in the way of increased production and the saving of unnecessary waste, not to speak of the trouble that will be saved the operatives—which means a great deal toward keeping them satisfied—if the bobbins on the different machines throughout the mill are properly built.

Starting at the slubber, a machine that doffs anywhere from five to twenty times a day, it can readily be seen under what a disadvantage the machine is run when the full traverse of the bobbin is not being secured, or if the taper is too long, allowing less roving or yarn to be placed on the bobbin than its full capacity. It would not be so bad for the overseer to notice that the frame was not getting the full amount of roving on the bobbin, if he would at once give orders for the machine to be properly set, but there so many men who will say, "Well, it is only a matter of a few minutes work, and some time I will have it set properly." That's the class man that is always "going to". *Don't be that class of man.*

When frames are not getting the full amount of roving or yarn on the bobbins, they are making an unnecessary amount of trouble: first comes the loss in time and production; the operatives are expending unnecessary energy; the overseer has to keep more help than would otherwise be the case in order to keep the machinery from being stopped too long for this unnecessary doffing; the bobbins will run out in less time at the intermediates, again causing an unnecessary amount of wasted energy on the part of the employees; in fact the wasted time and energy caused from unfilled bobbins goes from one department to the next, and we might truthfully say pulls the dollars out of the stockholders' pockets.

It would surprise many of us, if it were possible to show it in dollars and cents, the money that is wasted from no other cause than imperfectly filled bobbins. Just think of paying about 33 cents for cotton and the high cost of labor and then picture this cotton going to waste. It is no wonder that the little things must be properly looked after if we are going to be successful. The nearer that the cotton is through the mill the larger will be the loss if allowed to go to waste. However, many more pounds in the carding will of course bring the cost up in that department

When we refer to the slubber, it of course covers all fly frames, and when it is considered that we have the slubber-intermediate-speeder-spinning machines and sometimes the jacks (fine frames) and the great number of bobbins that is required to fill the creels of these machines, it is no wonder that some of us can not be successful when we overlook such *little things* as putting the maximum amount of roving or yarn on the bobbins.

It costs more, makes less production and more waste, and it is harder to keep help satisfied when we do not fill the bobbins, because they must do more work and do not get as good results. Take, for instance, a mill on hosiery yarn. If the spinning bobbins are not filled to capacity it not only causes more doffing in the spinning, but when the yarn arrives at the winder room, the winder hand cannot keep the ends up, therefore she will not make as much production, she will get less pay and make more waste, and it is only natural that the mill will have a dissatisfied hand under those conditions. Not only is that the case in the winder rooms, but in every department in the mill.

There are very few men in charge of rooms who cannot get a perfect bobbin and one that is filled to capacity, if they only would do it.

Honest Bill (Ky.)

Balanced Twist.

EDITOR COTTON:

In your issue of November I note an inquiry regarding folding together two threads of 40's yarn and doubling this to 4-ply 40's and obtaining a balanced twist, using a multiple of 4 times the square root of the counts in each process.

I am taking it for granted that the inquirer also had in mind using a multiple of 4 times the square root in the single 40's that the ply yarn was made from. This being the case the single yarn would contain 25.298 turns per inch, the 40's two ply producing a number 20's would contain 17.888 turns per inch, and the 20's two-ply producing a 10's yarn would contain 12.649 turns per inch. I catch from the inquirer writing that he wants to know if this will produce a balanced twist.

The twist given is in proportion to each count, but if both processes of twisting is counter clock-wise "Honey of R. I." will find his ply yarn No. 10's will still have a tendency to kink or snarl up if reeled off in a skein unless he leaves it in a conditioning room under heavy humidity for 24 to 48 hours.

Balance twist in a ply yarn is an amount of twist inserted in an opposite direction to the twist in the single yarns that compose the ply yarn, that will counterbalance the force of the remaining twist in the single yarn. Balanced twist is rarely ever termed in practical work where

mills only use one process of twisting; but it is generally in use in the manufacture of cable cords where one process of the twisting is clockwise, or same as spinning, and the finishing process is counter clockwise, or the direction of twister twist, so to speak. We call a yarn a balanced twist yarn because the same multiple of twist is used in the single and ply yarn count, but this doesn't necessarily produce a balanced twist yarn if only one process of twisting is used. It does produce a proportionate twist yarn but the skein will not stand out straight without kinking or snarling unless treated to humidity as heretofore stated.

I do not believe a practical balanced twist yarn can be obtained except by *two* processes of twisting, one being clockwise and the other counter clockwise, where the same multiple of twist is used in both counts. If any one can produce a balanced twist on two ply 40's with 4 times the square root of the counts in both, I would like to see it.

The writer has made ply yarns for practically every conceivable purpose used from 1.25's to 60's and never yet saw a perfect balanced twist until he began to produce cable cord for the tire trade. The same proportion of twist in this case does produce a balanced twist where the two processes of twisting are in opposite directions.

The writer recalls one mill where the orders called for 50's two ply mercerizing yarns and a multiple of 3 times the square root was to be used in the single and two ply. We used 21.25 turns in the single and 15 turns in the two ply, but it would still have a tendency to snarl in the skein. This was also true on 50's two ply lisle with 3½ times the square root used in both cases. One of these yarns was made from 1 3-16 inch peeler and the other from 1¼ inch Egyptian and 1⅝ inch Sea Island. However these were satisfactory to the trade after being conditioned.

The heavier the yarn, the nearer we can come to getting a balanced twist where spinning and one process of twisting is involved and when the same multiple is used; but in no case, East or South, have I seen this exactly produced where three times the square root and upward were used as a multiple.

I have had charge of the entire yarn department of an Eastern mill where we spun everything from hosiery to ratine in counts from 8's to 80's and each day's run of bobbins was stacked away for 24 hours in bins with a damp sack placed between each layer of bobbins, in order that the skeins would not snarl up but remain perfectly straight and contain the twist called for.—*J. V. M.* (*Mass.*)

A partnership has recently been formed at New Bedford, Mass., by Nathaniel S. Chase and Myron P. Howland, industrial engineers operating under the name of Chase & Howland. Their offices are located at 545 Pleasant Street, New Bedford. They are not only industrial engineers, but also mill engineers and mill architects.

The Steel Heddle Manufacturing Co., 21st Street and Allegheny Ave., Philadelphia, Pa. are sending to their friends in the trade a large wall calendar for 1918. This concern maintains a Southern office at Greenville, S. C. of which Hampton Smith has charge.

If a man has money to burn it is because he is too wise to apply the match.

Observation.

EDITOR COTTON:

Trained observers amongst mill operatives are not very common and yet this qualification is within reach of everyone. By developing this power of observation, mill men in executive positions can obtain improvements throughout their organization without much outlay. Careful observation of speeds, drafts, twists and humidity will soon show the observer at what point maximum efficiency is obtained. The writer hopes by giving a few practical illustrations to show what can be done along these lines. The illustrations are taken from work done in a number of different mills. The following is taken from a yarn mill making ply yarns.

In the spinning room 24 frames running on the same number of yarn were selected for observation, 12 frames had a front roll speed of 90 r.p.m. and 12 frames on a speed of 100 r.p.m. The observer noted the number of ends down at five different intervals, two hours apart. On the 12 frames on the slower speed there were a total number of ends down of 142 while on the higher speed there were only 129 ends down. This proved that as good results were being obtained on the high speed as on the lower speed although it was feared that the high speed would have a detrimental effect on the running of the frames. By increasing the speed on the 12 frames from 90 to 100 which is a 11 per cent increase, a very valuable lesson can be drawn. Assuming the production on the 12 frames to have been 1500 pounds for a 60 hour week, an 11 per cent increase would be 165 pounds, which if sold at a profit of 25 cents per pound would increase the earnings $41.25 per week. If a few observations such as were made in this case paid at the rate of $41.25 per week, then it must be a profitable factor to consider.

Taking another case where the spinning room was falling behind in production noticeable from the fact that there were a number of looms stopped in the weaveroom. In making observations for ends down it was found that there was 7 per cent of the ends down; on one frame alone there were 45 ends down most of them broken backs. The overseer's attention was drawn to this and in a very short time the ends down were reduced to 3 per cent, a very decided improvement. This spinning room was in bad shape and other points had to be noted for correction. Another defect found was that the weight levers were resting on the roller beam, this caused the top rolls to be improperly weighted. The section hand was put on to the job of rectifying this defect. Another defect found was a large number of slack spinning bands, these were broken off and the band boy was made to replace with new bands. Checking up the twist on the warp yarn being spun, it was found that the twist multiplier being used was 5.1. This was excessive twist and the spinner told me the ends would not stay up without it. The yarn was three numbers on the heavy side and in addition to the yarn being on the heavy side, the twist gear was two teeth smaller than previously.

On examination, the roving was found to contain an abnormal amount of twist, this was evident from the fact that the middle roll would fail to draw and the roving would run off the sides of the roll. A temporary remedy had to be suggested so that the hard twisted roving could be spun. Here is what was done; the back saddle was so

placed that the middle roll carried the weight which previously had been divided between the back and middle roll. This gave a pressure on the middle roll of 5 pounds as against 2½ pounds before the change was made. The back roll was run unweighted. This was only temporary until roving of the correct twist was brought round from the card room. The trouble in this spinning room was poor supervision. To get good supervision the salary must be attractive in order to get a good man and when a good man is obtained it should be put up to the management to see that he gets a fair trial.

Citing another example of spinning room observation, the frames were equipped with hank clocks and it is from this observation only that criticism will be made. Taking the production on 8 frames for the purpose of illustration, this showed as varying from 37.4 to 46.7 hanks for the week's run. Expressing the variableness of the production on a per cent basis there was a variation of 22 per cent on the 8 frames. If all of the 8 frames had been producing 46.7 hanks there would have been 474 pounds additional yarn spun. This would have been an 11 per cent increase. It was certainly worth while to go after this 11 per cent increase of spinning production as the weaveroom was waiting on warps.

Our illustrations so far have only treated of spinning rooms, but the same valuable results can be obtained in any other department of the mill. Some trouble was experienced in a card room with the Jack roving falling off in production and there was a demand made to find out what the trouble was. Watching two frames for a period of one hour, one frame was stopped 10 times; 6 out of the 10 times the cause was hard ends. The second frame was stopped 12 times, 4 times out of the 12 for hard ends. The frame hands were getting "touchy" because they were being paid by the hank and their pay was falling relatively with the drop in production. The frame hand was located who was making the hard ends. He made his piecing wet in addition to applying more twist than was necessary to hold up the end. The hard ends eliminated, there was more twist put in the jack roving and for the time being the trouble was cleared up in the jack frames.

On two of the second intermediates, the ends at the start of the set were running very tight and towards the end of the set, the ends would run very slack. This caused an excessive number of stops necessary to piece up the broken ends. To improve this condition the starting place of the cone belt was changed from the extreme ends of the cones to a point two inches from the end, this gave the correct tension for the first layer and by selecting the correct tension gear, this same tension was maintained throughout the set. The result of this change was a better running pair of frames and a more contented frame hand. Bad running conditions has its effect on the help and they change at the first opportunity. Good running conditions and satisfied help go hand in hand. Whatever can be done to make the work run better is a great help in retaining operatives at such times as this when there are more jobs than hands to run the jobs.

Another observation of a very interesting character was made in a card room one very humid day in mid-summer. The atmosphere was depressing out-doors and in-doors. Without humidifiers the inside of the room would have been bad enough, but to make matters worse the humidifiers were running. The combers started to run bad, the comber being a very sensitive machine, it shows up first in bad work in an atmosphere of excessive humidity. Readings of the humidity were taken by means of a sling hygrometer. The relative humidity was from 59 to 72 per cent. It was decided to shut off the humidifiers and this helped to reduce the humidity, but still the inside of the room was depressing. If fans had been in use in this room so that the inside air could have been drawn off, the temperature could have been reduced to good advantage. Conditions of excessive humidity during "dog" weather are hard to overcome unless ventilating fans are in use.

To prove that the air inside of a mill is more or less stagnant, temperatures taken at two points 30 feet apart showed a difference of 10 degrees. This was in a spinning room where a group drive was in use, one motor to four frames, the motors being in the center of the room the temperature was anywhere from 5 to 10 degrees higher at the point where the motors were located.

An illustration of what can be done in the picker room is shown by the following: The breaker laps were seen to be very spongy and large. The laps weighed 60 pounds and were very unwieldy. It was decided to cut down the weight of the lap to 50 pounds. To overcome the softness of the laps, the friction let-off was examined and found to be very greasy and slipping rather easily. The friction leather was cleaned and the weight on the lever arm moved toward the end of the lever. With this attended to, a firmer lap was produced. The picker hand felt grateful for this improvement, the laps being easier to handle. In order that the production would not be less, due to the lighter lap, the lap roll was speeded up enough to give the required production.

An interesting way of increasing production was brought to the writer's attention recently. A new boss carder was installed and he of course wanted to make a good showing. The card room had fallen behind the spinning. To increase the card room production, the novel way in which he accomplished it was by increasing the finisher lap from 40 to 45 pounds. No other change was made throughout the card room. Changing from a 40 to a 45 pound lap was equal to a 12½ per cent increase. Not a draft or twist gear was changed on the roving frames. The reader can imagine the troubles he was to encounter by such a change as this. Such a change ought to have been planned out more carefully and changes made on the roving frames to suit the increased size of the roving.

From the foregoing instances, the readers may form a plan for their own work and start improvements which will help them make their work run better. If the man making the observations is from outside the mill, the first thing he has to do is to get the various overseers on his side. The observer must explain his position and what he is trying to accomplish. If the observer is from another department of the same mill, then he must gain the confidence of the man who is in charge of the room where the observations are made. Many overseers are very sensitive about losing their job and the first thing they think about is that the man making observations is trying to get their job. Winning the overseer goes a long way to help in getting results. He will be able many times to tell of troubles that need to be remedied. It is necessary frequently to spend some time with the overseer, explaining theories which affect the various operations under his control. Nothing is lost by

showing a man how to do things for himself. Figuring draft, speed, twist and production are items which very few overseers can handle with facility. In our Southern mills we have many good overseers who have had but scant education and it is men such as these I have in mind when it comes to go out of one's direct way and do a little missionary work. They are good men and they appreciate it.

Henry K. Dick (N. C.)

The Advertising Contest.

As announced in the December number of COTTON, the November contest was kept open for another thirty days owing to the late delivery of the November number. This allowed a number of contestants who, otherwise, would have been unable to have competed for the prize to take part in the contest.

The winning letter in the November contest was written by J. V. McCombs, Supt., Beaver Mills, North Adams, Mass. The letter follows:

North Adams, Mass., December 3, 1917.

EDITOR COTTON:

The best advertisement in the November issue in my opinion will be found on page 12 of that issue.

"Saving Coal". Think what those two first words in the advertisement mean to America today, and note the advertiser is not announcing a new apparatus to be tried out, but one that has proved its efficiency where efficiency should start in every plant, for the successful operation of a plant to its maximum production. Every engineer appreciates what 24 inches vacuum means to him when carrying a heavy load on a hot August day with the condenser receiving water at nearly the boiling temperature.

Mills have long recognized the advantage of a cooling system of some character. This is proven by the troughs often built all the way around the hot water ponds years ago. Many of such home-made apparatus is still in use today.

The Spraco Cooling System is one that can be appreciated by every mill management, not only in the saving of fuel, but also in the general appearance it gives to the mill premises over the old way of cooling condensing water.

Yours very truly,
(Signed) J. V. McCombs, Supt.,
Beaver Mills.

North Adams, Mass., January 14, 1918.

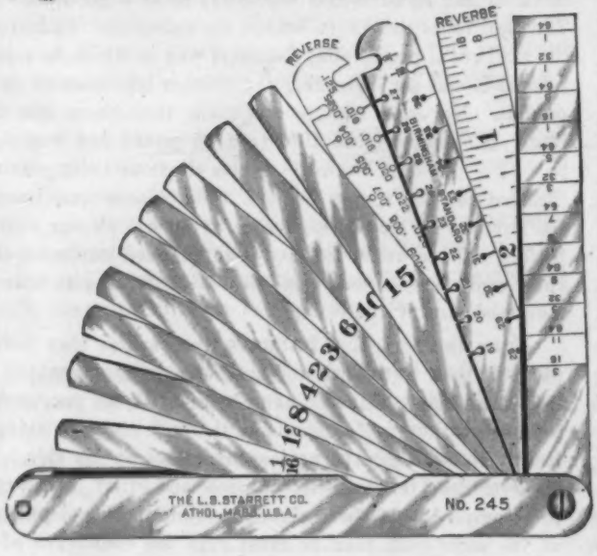
EDITOR COTTON:

Please accept my thanks for the gauge which was awarded to me as the prize won in your November contest; also for your letter of the 9th announcing the awarding of this prize. It has been a pleasure to me to note the men taking part and competing for these prizes. I also wish to congratulate you upon this unique proposition which assures the advertiser that his advertisement is being read before your journal is laid aside.

Thanking the judges for their decision in my behalf, I remain

Yours very truly,
(Signed) J. V. McCombs, Supt.
Beaver Mills.

Special Cotton Mill Gauge Free—



for a few minutes of your time.

The taper gauge shows the thickness in 64ths to 1/16ths of an inch on one side, and on the reverse side is graduated as a rule three inches of its length, reading in 8ths and 16ths of an inch.

The wire gauge, English Standard, shows on one side sizes numbered from 19 to 36, with two extra slots, one 1/16, the other ⅛ on an inch, and on the other side shows the decimal equivalents expressed in thousandths. This gage has also 9 thickness or feeler gage leaves, approximately 4 inches long, of the following thicknesses: .002, .003, .004, .006, 008, 010, .012, .015 and 1/16th of an inch all folded within the case, which is 4¾ inches long, convenient to handle or to carry in the pocket.

Our Service Department desires the opinions of active mill men on the quality of the work shown in the advertising pages of this issue of COTTON.

We are, therefore, going to give this gauge for the best letter by a mill executive who gives the clearest and most definite reasons why, and in what maner, any certain advertisement is, in his opinion, the best.

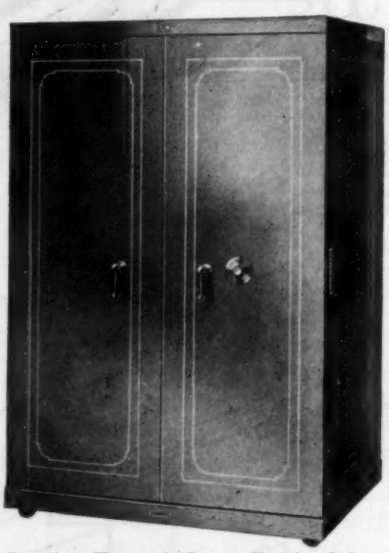
Contestants must be mill executives, from overseers to presidents, connected with spinning, weaving, knitting, or finishing plants. The letter must be accompanied by the name, address and official position of the writer in order to be eligible, and must reach this office not later than the first of the month succeeding the date of issue.

The judges will be the Editor of COTTON and the Manager of the Service Department, whose decision will be final. The name of winning contestant will be announced in COTTON'S pages.

Address Contest Department of COTTON, Atlanta, Georgia.

Certified Protection!

Protection—**plus** is given your valuable records when placed in one of the safes here shown. They bear the seal of the Underwriters' Laboratories—the testing department of the National Board of Fire Underwriters. Their seal certifies this line of safes fully tested and that you may entrust your records to one without fear of loss in a fire that might reduce your buildings to ashes.



Exterior View of Large Double Safe. Made in Six Sizes and Finished in Green, Oak and Mahogany.

GF Allsteel Safes

Why You Should Have One

Every modern business accumulates statistics such as cost-data, production-records, contracts, statements, etc., which are vital to its growth and success. You cannot insure these papers so the next best thing to do is to protect them. The Allsteel Safe affords the necessary degree of protection. Some "economists" do not discover this until it is forcibly brought home to them though loss by fire.

Interior Equipment May be Made of Over 200 Sectional Units—Plain Openings Divided by Shelves and Partitions—Card Cabinets—Document Files—Letter Drawers, etc. May be Interchanged at Will.

Twice the Capacity —Half the Weight

In buying a safe you pay for two things—protection and capacity. Compared to the old "Ironsides" type of safe, one of "Allsteel" gives your records **greater** fire protection and generally **twice** the storage capacity. This is accomplished in the use of lighter walls built up of a frame work of structural steel. This reduces the weight about one-half that of old-style construction. "Allsteel Safes" are readily movable when occasion requires.

Consultation Bureau

For the benefit of those interested, we maintain a consulting service. If you will give us an idea of the kind and volume of the different records you have to house, we will gladly make recommendations as to the size and type of safe most suited to your requirements. The use of this service entails no obligation.

The General Fireproofing Co.

Third National Bank Bldg.,

ATLANTA, GA.

The General Fireproofing Co., Atlanta, Ga.

Please mail Allsteel Safe Booklet.

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"DIXIELITE"

"Yes suh, boss! Dat am Dixielite. Hits jes ez white ez Ah is black, and 'taint nebber gwinna crack."

"Well, George, they've just painted those walls and ceilings, haven't they?"

"Naw suh, Boss! Dey painted dem walls 'bout two yeahs back!"

"But, George, how did you people keep them so white and clean for so long?"

"Why Boss! Dat Dixielite paint jes natchly stays white. 'Cose it gits a little mess'd up, and den us washes de walls off 'bout wunce a yeah and den dey's ez white an clean as dey ebber wuz."

"But, George! Hasn't that paint cracked or peeled anywhere since it was put on those walls and ceilings?"

Naw suh! Dem walls jes lak dey wuz when dey painted dem. Ain't seed no sign ob a crack. Looks lak dem walls ain't nebber gwine need paintin again Boss!"

That negro didn't know much about mill white paints, but his eyes told him that those walls painted with Dixielite stayed white and wouldn't crack or peel. That's all anyone could ask of a mill white.

Dixielite is a white that has behind it over 65 years of paint making. It may cost you a little more than the ordinary mill whites on the market, but you know it's worth more to have an improved white on your walls and ceilings that you can depend on to *stay white* for years and *not crack or peel* at any time.

Demand Dixielite from your painting contractor. If he cannot supply you, write to us and we will see that you are supplied.

A sample will be sent gladly on request.

Acquaint yourself with this superior mill white—different from the rest.

Wadworth, Howland & Co., Inc.

139-141 Federal Street

BOSTON, - - - - - - MASS

Makers of Bay State Brick and Cement Coating

BAY STATE

America's Foreign Trade.*

BY FRANCIS H. SISSON.

With President Wilson's message to Congress still ringing through the world as the expression of Democracy's aims and determination, it is exceedingly interesting to note particularly one feature of the address. Despite the fact that, as the President clearly defined the issue, "our present and immediate task is to win the war, and nothing shall turn us aside from it until it is accomplished," he specifically recommended our foreign trade to the consideration of Congress.

His exact words were:

"The legislation proposed at the last session with regard to regulated combinations among our exporters, in order to provide for our foreign trade a more effective organization and method of cooperation, ought *by all means* to be completed at this session."

The juxtaposition of that paragraph and one which closely followed, in which the President urged Congress to concentrate its whole attention and energy on the vigorous, rapid, and successful prosecution of the great task before us, emphasizes the importance of our foreign trade in helping to win the war.

Considering the countries with whom our trade has principally grown, our imports from Europe during 1917 remained below those of any year since 1905. From the countries of North America (Cuba, Canada, West Indies, and Central America) our imports were more than double those of any pre-war year. From South America our imports were treble those of 1911 and from Asia and Oceania they were two and one-half times those of 1910. Our imports from Africa during 1917 were three times as much as in any year prior to the war. Our exports to Europe were nearly quadruple those of 1910, while our shipments to North American countries nearly trebled the 1910 figures.

Our exports to South America, Asia, Oceania, and Africa were in each case nearly double those of any year prior to the war. The most remarkable change apparent in our foreign trade is the shifting of trade routes between the Dutch East Indies and the United States. Prior to the war practically all of the rubber, spices, gums, and other tropical products, which we obtained from the Dutch East Indies, were shipped by way of Rotterdam and Amsterdam. The shutting off of this route by the war forced this trade to cut a new channel for itself, making direct connections between the Dutch East Indies and the United States, so that in 1917 our imports from these islands were more than four times those of 1912, while our direct exports increased nearly seven-fold what they were prior to the war.

The connections which the Dutch East Indian firms have formed in the United States as a result of this forced shifting of trade routes promise to prove permanent, and it is not likely that any great proportion of this trade will go back in to the former channels after the war.

A striking inference to be drawn from our export surplus is that the movement of exchange against New York, on the neutral European markets, has not truly reflected our own commercial or economic situation, but only our voluntarily assumed burden of supporting the exchange market of our Allies.

The conservation of our enormous gold reserve, which is approximately three billion dollars, and the inevitable increase of our already large trade and credit balances, will rectify factitious values, and the American dollar will regain its rightful dominance of neutral exchanges. It should be remembered that we hold more than one-third of the world's total gold reserve; that is, coined gold and bullion, upon which the world's credit structure rests.

The part which money plays in inter-national transactions, however, is only temporary. Goods will eventually be produced abroad with which to repay for those that have been shipped from America, and as this is done, these monetary pledges will ultimately find their way back across the Atlantic in exchange for imported merchandise.

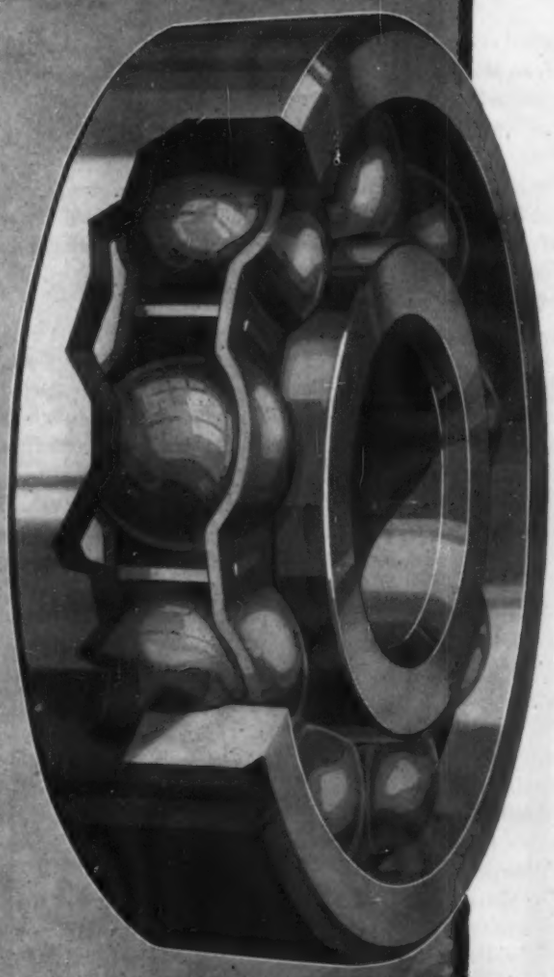
For years our business men of vision have insisted upon the necessity of developing our merchant marine through ship subsidies and fair regulation, in order that the industrial and commercial interests of this country could find their proper place in the markets of the world. Only the exigencies of war could open the eyes of our governing authorities to the wisdom of this position, but now we find ship subsidies freely granted and every effort being made to give the American flag its place upon the high seas and to open the ocean highways to our great foreign trade.

The natural companion of the American merchantman in foreign lands is the branch of the American bank, and slowly we are beginning to reach out to take our place in the world of finance as we are in the world of commerce.

Another powerful instrument to promote our financial dominance and security exists in the trade acceptance. The more general use of trade acceptances will tend to safeguard the business future by materially developing the credit resources of the country on a sane and safe basis. They will help to check overbuying, eliminate losses from

*Extracts from an address before the New York Foreign Trade Study Club.

STURDINESS



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Experience has taught that New Departures are *powerful* in their defeat of friction evils—*stubborn* in their resistance to wear—*firm* in their reliability.

New Departures endure, because not only are they rugged in design, material and construction, but they are *engineered* into your machines—backed by the experience of experts.

Engineering consultation service free and confidential. Unusually helpful data sheets upon request.

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bad and slow collections, simplify bookkeeping, and rate the buyer as a preferred customer. All of these advantages, and many more which trade acceptances possess, obviously will benefit the customer also. Thus the general adoption of trade acceptances is a national economic necessity.

One of the salutary results that will grow out of the extended use of acceptances will be the establishing of a closer relationship between the manufacturer and merchant and the banker. The selling of products abroad necessitates the granting of some form of credit. In many instances, the manufacturer or merchant is not himself in a position to give credit, but he can arrange for it with his banker by means of a trade or a bank acceptance—a sound circulating medium of finance that commands a low interest rate. England achieved her preeminence in the financial and commercial world largely by the use of acceptances. American business and industry must employ the same means to the fullest possible extent if they are to realize their possibilities. In this way, we can meet our competitors on their own ground, and with their own credit weapons.

This has been made possible by the Federal Reserve Act, and subsequent amendments enlarging its scope, which have enabled the foreign departments of the great American banks to offer the most complete facilities for the financing of the international trade of their customers.

No one doubts today that the ending of he war in Europe will release an amount of energy for peaceful pursuits simply incalculable on the basis of any previous experience. Periods of political, commercial, or artistic development almost invariably follow disastrous wars, and the reach of that development has nearly always been proportionate to the amount of the resources and energies that were expended during the continuance of the struggle. Seemingly, either the pressure put upon those engaged gave them a running start when they turned their attention from war to business, or the sheer ecstacy of being relieved of war's burden manifested itself in an overflowing, exuberant devotion to industry, commerce, learning, and the arts.

If human nature holds true to form what shall we say of the possibilities that inhere in the ending of a war of the magnitude of that in which we are now engaged? Where before have we seen a civil war or an inter-national conflict such as this in which all the world is taking part directly or indirectly? The belligerents who are fighting for victory, and the neutrals who are taking advantage of every favorable opportunity, are both learning concentration of effort and variety of accomplishment. The capacities of both for production and distribution are being enlarged. The facilities which necessity has made imperative for quantitative production are becoming familiar to peoples who had little knowledge of them before. The whole industrial and commercial machinery of every nation on the globe has been speeded up. To stop it all precipitately will be either impossible or disastrous. There is every indication, however, that the far-seeing nations are preparing not to shut down their vast industries, either gradually or suddenly, but to keep them going at their present speed. Our enemies are going to do so because that was their original purpose. Our friendes are going to do so because the necessities of the situation compel them to.

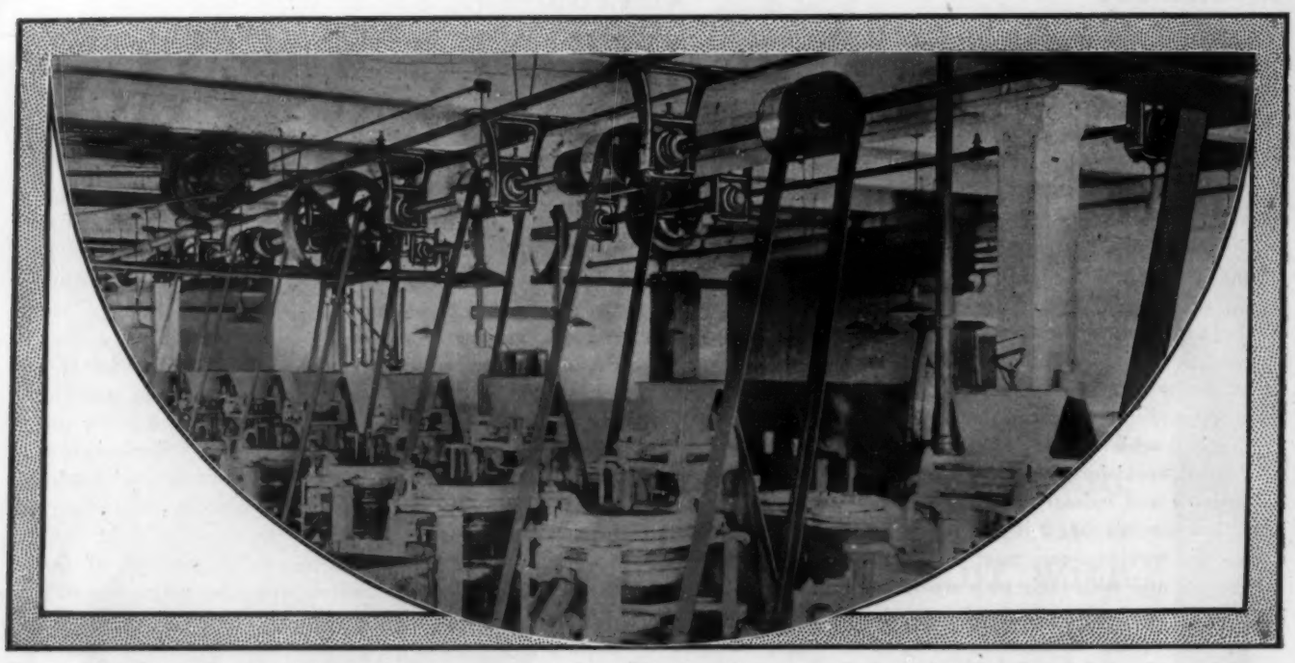
The present war was conceived in and begun by an over-reaching Teutonic ambition for world conquest, political and commercial. Despite the multifarious, conflicting issues which have been injected into and developed during the struggle to obscure that original motive, the Central Powers have never lost sight of their real objective. Already they are planning to achieve by propoganda and other means that which they are failing to win by force of arms—the domination of world trade.

The Bureau of Foreign and Domestic Commerce of the Department of Commerce recently disclosed the significant information that in Germany the individual business man, all the local and national associations of business men, and the various Government departments, are even now strenuously occupied with the problems which must be worked out after peace is declared. Among the important features of Germany's systematic organization are commercial education, the promotion of trade by Teutonic settlements in foreign countries, the developments of banking and shipping facilities, and the painstaking cultivation of foreign markets.

When the war is over, the world's supplies of foodstuffs, metals, building materials, and other major necessities, will have to be distributed equitably for the necessary reconstruction period. There can be little doubt that our productive capacity will be taxed to its maximum to meet a large part of Europe's demands, but with war's restraint on shipping and transportation facilities removed, and the need for money in practically all countries of the world, there may be a precipitate and radical readjustment in the prices of raw materials. We should prepare for this contingency, and the many changes, financial, economic, and commercial, which it would cause.

In every warring country where everything has given way to the manufacture of munitions and supplies there will be a demand for goods. Construction will be proportionate to the destruction that has taken place, labor-saving machinery—especially the automatic devices in which America leads the world—will be needed everywhere to fill the gaps that war has made in the ranks of labor. Requirements that have been unfilled during the war—the comforts and luxuries that have been denied by the exigencies of the great struggle—will have to be supplied in greater volume than ever. All of this means business on a scale not dreamed of. Besides this natural turn of affairs, there is to be considered the impulse which the staggering war debts will give to manufacture and commerce. There will be keen competition for favorable trade balances. By so much as they have spent their substance in this war will the capacity of the nations to absorb gold be increased. The steady stream of that metal toward America will be curtailed. But if this country is to maintain its present position of financial leader it must not be stopped altogether.

Such is the problem. How shall we meet it? We must be firm and resolute in our purpose to work out the desired solution. We must make up our minds that we are going to do so. It is that conquering feeling—that inspiration for victory—which gives zest to endeavor, originality to invention, and confidence to purpose. Having it, the armies and navies of business must be mobilized for an overseas expedition of long duration and wide distribution. That service will require support at home. It will require of those who participate in it a very large measure to accommodate themselves to unfamiliar circumstances and of high regard for the patriotic character of the enterprise upon which they have embarked.



This Firm Solved Its Power Shortage Problem

By Installing Self-Aligning Ball Bearing Hangers

TWO YEARS' SERVICE—NO UPKEEP

THE management of this paint and varnish concern takes great pride in the clean and sanitary appearance of its plant and machinery.

The representatives of this firm stated recently that they selected S K F Ball Bearing Hangers because these hangers do not throw oil on the machinery, walls and floors.

For this reason alone they consider S K F worth the price and have already installed sixty hangers, some of which have been running FOR TWO YEARS WITHOUT UPKEEP except one oiling.

The S K F Transmission Bulletin cites many such instances. Send for it today and ask about S K F Engineering Service.

SKF BALL BEARING CO.

Hartford, Conn.

282

SKF BALL BEARINGS

From the war we have learned the usefulness and the wastefulness of untrained effort. The lesson should be applied to this new undertaking of ours. The war has raised innumerable new business problems which have demanded instant solution. Each has had to be worked out alone. There are no training camps for business men, and they are urgently needed. The merchant and the manufacturer are just beginning to work together and to exchange opinions and experiences. If America is to be the leader in the contest for the world's trade, there must be not only co-operation, but there must also be no limits to our commercial vision. If we would succeed in foreign commerce we must inject into our young men something of that spirit of adventure that sends English and French and German and Japanese youths into every corner of the earth. They go wherever there is an opportunity to develop foreign trade. Often educated in the foreign land where they seek their fortunes, they come to such a complete and sympathetic understanding of the people there and their methods of doing business as gives them an inestimable advantage over anyone who may come later on to reap the benefits of their enterprise.

The use of such pioneers by our rivals in the foreign field has thrown into higher relief our own shortcomings. We have yet to learn completely the obvious truth that if we would do business on a considerable scale with a foreign country we must do it as they want it done. With competition so keen, the foreign buyer who is not satisfied can easily go elsewhere. He wants what he wants when he wants it, as a popular song of a few years ago put it. If he wants long credits and can get them without arguing the matter with a salesman who can't see why he shouldn't agree to short term notes, he will do so even if at bottom he prefers the goods of the short term credit man. The same principle runs all through this foreign business. American goods are being taken now almost anywhere ships are available for carrying them and no questions are being asked. But the moment the war ends all that will be changed. Then traders are going to compete for buyer's favor, and the buyers will again insist upon being treated with distinguished consideration. They will be accepting nothing that is not what they wish. They will insist on having their merchandise packed for their convenience,—not for the convenience of the careless shipping clerk.

It is obvious that the salesman's success depends largely upon the management of the industry at home. And in the critical period of readjustment that will follow the war it is important that industry shall be definitely pointed toward the proper goal. Industry must have a chance to realign its cohorts. The number of workers returning to their former tasks must be regulated by the rapidity with which industry turns from the business of war to that of peace, and the extent of industrial expansion in new undertakings.

As foreign trade will not thrive if industry is cramped at home, neither will industry thrive without adequate transportation facilities. Getting the finished product to the seaboard is only a small part of the problem. The manufacturer must be assured of a steady supply of materials at the lowest possible cost and with a minimum of delay.

Capital will come readily to the aid of foreign trade if such trade is properly conducted. The American people have shown their confidence in capital by placing in the hands of its trustees unprecedented sums. Hosts of our citizens who had little, or no, knowledge of the value of investments have learned how to make their money work for them. It is a habit not to be cast off when once acquired. Probably we shall have competition from other nations for these stores of usable wealth, but the American foreign trader who selects his territory wisely, who conducts his business with care, should be able to match, and to overmatch, his rivals on the score of capital as well as everything else.

He who would be successful must watch closely the currents of trade as they reshape themselves after this war. The commercial map is being remade. The rearrangement of the highways of the sea, which began with the opening of the Panama Canal and which was temporarily checked at the outbreak of the war, will be carried out. There will be a shifting of the strategic trade centers of the world. The great vantage points of commerce will rise or decline in power according to the rearrangement of the currents of international trade. Some will sink into obscurity; others will become richer and more powerful, and be the centers of the commercial struggles of tomorrow.

This should mean world leadership for the United States with its resources of men, materials, and money such as no nation from the beginning of time ever possessed. It means a horizon as broad as the earth. We must rise to the great opportunity, created partly by circumstances, but largely by the native ability and initiative of our people. The prospect is so brilliant as fairly to dazzle the imagination. But its realization will come only after we have successfully fought our way to victory. And its materialization imposes upon us the grave responsibility of discharging our duties to mankind with thoroughness and honor.

Foreign Trade Convention.

The Executive Committee of the National Foreign Trade Council announces that "owing to the railroad congestion and the desire of the Council to cooperate with the Government in the relief of the situation due to the war," the dates of the Fifth National Foreign Trade Convention to be held at Cincinnati, Ohio, have been changed from February 7th, 8th and 9th to April 18th, 19th and 20th, 1918.

No change in the theme of the Convention or in its plan and scope is contemplated. The three days of the Convention will be devoted to the obligation upon the foreign trade enterprise of the United States in helping to win the war, as well as to discussion of the war winning value of foreign trade in sustaining credit through the maintenance of the gold reserve, and in insuring supplies of necessary raw materials for war use. Consideration will also be given to the demands and problems of the renewed competition after the war. Registration of delegates already made indicates that the April Convention will be the most successful ever held by the National Foreign Trade Council.

Nearly all of the sixty members of the National Foreign Trade Council are devoting the whole of their time to work in connection with the war.

Merchants and manufacturers who are desirous of receiving invitations to attend the Convention at Cincinnati are requested to send their names and addresses to O. K. Davis, Secretary National Foreign Trade Council, 1 Hanover Square, New York City.

Liquid Chlorine

Cylinder with Cap Off
Height 54 inches

Simpler and Easier to Handle.

Liquid Chlorine, the new Bleaching Agent, is far simpler and easier to handle than the old bleaching powder method. It is a nicer, cleaner, more efficient and scientific method. No material changes in your present method of bleaching are necessary to adopt this new agent. It comes in steel cylinders. The cylinders are provided with valves which when opened allow the chlorine to escape in the form of gas, and this gas dissolves completely into a clear

100% Bleaching Agent

Yarns and cloth bleached with Liquid Chlorine have a much softer feel and a positive increase in the tensile strength of the goods is obtained. Less acid (or sour) is required, which eliminates tendering and also results in a large saving in the amount of wash water required. No odor is left in the goods.

Liquid Chlorine is more economical, and you save on freight charges also as 1 pound of Liquid Chlorine is equal to 4 or 5 pounds of bleaching powder.

Let us demonstrate Liquid Chlorine in your own mill. Just ask us to send a man.

Write today for booklet

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General Offices 18 E. 41st St.,
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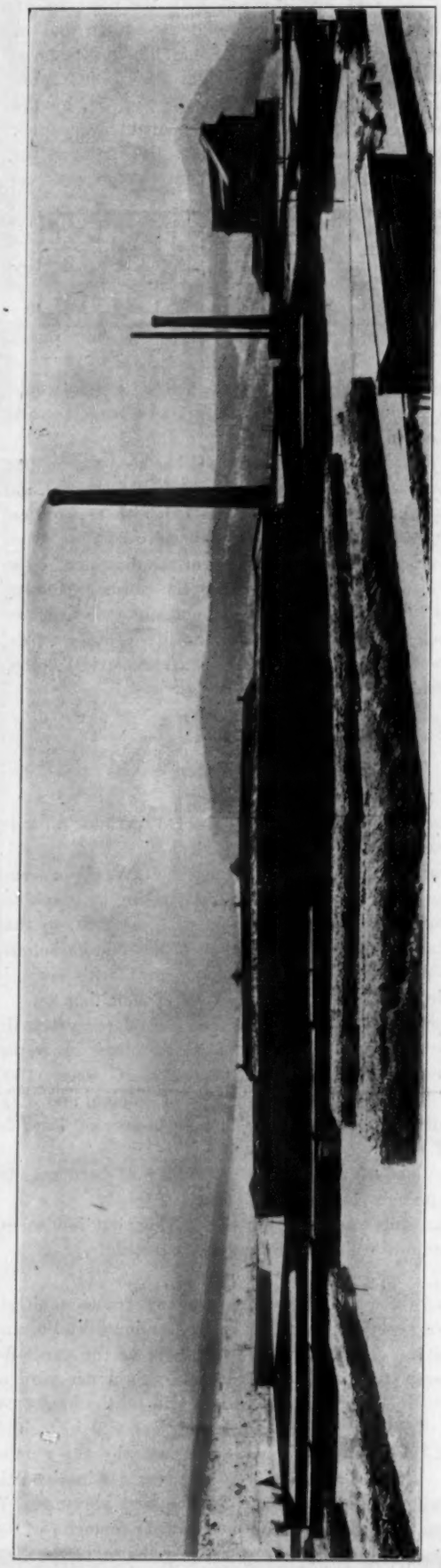

PAPER AND PULP MILLS OF THE ODELL MANUFACTURING COMPANY, AT GROVETON, N. H.

Making Paper for the Textile Trade.

Making paper for mill use is a business few mill men have ever thought much about. They know what qualities they desire in the paper they use, and they sometimes growl when they get stuck with a bunch of paper they bought "cheap" from the representative of some unknown firm whose line of talk was better than his line of paper.

The trade has heard much during the past year of the progress made by one of New England's most energetic paper making concerns, the Odell Manufacturing Company, which operates paper and pulp mills at Groveton, N. H. It will probably hear more in the years immediately ahead of us. Therefore the following reference to the company and its products will be of interest.

It was in 1895 that the Odell Company purchased the one machine mill at Groveton. First it might be well to state that the paper industry in Groveton was launched by a Mr. Sivret, who in 1890 organized the Groveton Mills Co. and began the erection of a paper and soda pulp mill which was completed in 1892. After being in operation a year the plant was transferred to the Coos Pulp & Paper Co. and later taken over by the Norway (Maine) Savings Bank. The Odell Mfg. Co. purchased the property from the bank and immediately began the erection of a sulphite mill, and also added a second paper machine. Since that time the history of the mill has been one of consistent progress.

During the past year the company has been engaged in rebuilding and enlarging the sulphite mill. There was installed and is now in operation a new digester, which will increase the capacity approximately 30 per cent. There are now four digesters in operation and the production has been brought up to the very respectable total of about 90 tons every 24 hours. The new digester is housed in a brick and steel addition to the digester house.

The company also built a new screen room, save-all room and filter house. In the screen room they have installed six lines of Harmon Inclined Screens, five screens in each line. There is also being installed three sulphite rotary knotters made by the Improved Paper Machinery Co. of Nashua, N. H. The old wet machine has been repaired and two new 80-inch wet machines have been installed and placed in operation. In the filter house four filter beds have been placed, this installation providing for three million gallons of clear water every 24 hours in addition to the capacity of the old filters.

This betterment work has been under way for the past year and results have shown that the executives made a wise move when they decided to undertake it to the extent outlined. All of the work is now practically completed, the new equipment is running very satisfactorily, and, as already mentioned, there is now being manufactured every day close to 90 tons of high grade sulphite pulp.

Number 2 mill, which was built and started in 1908, consists of beaters, No. 3 machine and finishing rooms. The beater room is 96x112 with nine 1,800-pound Jones beaters, one Jordan and all other necessary machinery such as chests and pumps, etc. No. 3 machine is a 158-inch Pusey & Jones Fourdrinier, which trims 144 inches. This machine is kept in shape for a big production on high-grade heavy-weight manila and fibre paper. It is driven by an American Ball two-cylinder, variable-speed engine, and a single-cylinder, constant speed engine. The building which houses the machine is 275 feet long and 82 feet wide, thus allowing space for another large machine, which it is hoped will be installed soon. It probably will be a 158-inch 3-cylinder machine to turn out water-finished manilla and sulphite tag papers.

In the boiler house there are seven 200 and ten 150 H. P. boilers, all return tubular, and developing about 3.200 boiler horsepower.

It will be seen from the photograph that the No. 2 mill as well as a good part of the sulphite mill is built of brick and steel with cement floors. The roofs are all steel trussed with purlines, 3-inch Georgia pine plank with tar and gravel covering.

The sales office of the Odell Mfg. Co. is located at 527 Fifth Ave., New York. A. N. Waring, manager of sales, is one of the best known men in the selling end of the paper business and has a host of good friends throughout the jobbing trade. Since taking hold of the Odell sales he has been remarkably successful in placing the large output to the best advantage. C. H. Morian, assistant manager of sales, was connected with the jobbing trade not so very long ago, and is therefore well acquainted with the requirements in that field. His energy and aggressiveness have been of great assistance to Mr. Waring and the company.

The Production of Narrow Fabrics.

(*Continued from page 276.*)

therefore 1 3-5 inches in width. The selvage threads were bleached flax, but the remainder of the fabric was jute.

An examination of the design A, Fig. 10, shows that the two central threads which form the junction of the oppositely-directed twills "cut" or weave in the opposite order.

Thus: Thread No. 24 weaves $\frac{2\ \ 2}{1\ \ 2\ \ 1}$ while

Thread No. 25 weaves $\frac{1\ \ 2\ \ 1}{2\ \ 2}$

Two methods of drafting the above design on a 4-leaf harness are shown at B and C, and their respective weaving plans on the extreme right. The method B, or straight draft, is certainly the simpler one from the weaver's point of view, but method C, known as the skip-shaft draft, enables slight mechanical advantages to be obtained in the arrangement of the top mounting of the harnesses; and, under certain conditions, such mounting and draft are exceedingly convenient for a temporary change to plain weaving. Both methods are practised.

Figure 11 shows the design and a straight draft for a fabric similar to that in Fig. 9 but with two sections twilling to the right and the middle section twilling to the left. The fabric contained 72 threads and was 2¼ inches in width, i. e., 32 threads per inch.

In some fabrics made with the 2 up 2 down twill, the selvages are formed without any alteration in the draft, and, consequently, the twill in the two outer sections is continuous. In other cases, the arrangement of the draft for the selvage threads is modified in order to ensure a neat and effective edge. This will be noticed in both Fig. 10 and Fig. 11 where the two outer threads in each selvage or design cut with each other, while the inside one at each side cuts with the adjoining thread marked in solid black. If more than two threads are required, each pair is made to weave as indicated by the crosses, and drawn through the harnesses as shown. This arrangement, however, requires the adjustment of the order of picking to the design. In the sections *D* and *E*, Fig. 10, the selvage threads only are marked, and they are identical with the marking of the corresponding threads in the design *A*, and in that in Fig. 11; one repeat in the way of the filling is shown. If the shuttle travels from left to right for the first pick of the design, as indicated in section *D*, Fig. 10, by the arrows at both ends, the filling will be caught every pick —first on the right and then on the left. If, however, the shuttle is driven from right to left for the first pick, as

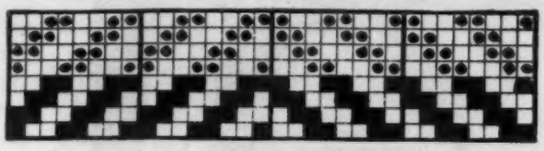

FIG. 12.

indicated by the arrows in section *E*, neither section would interweave properly until the draft for the selvage threads had been changed to suit.

In both designs in Fig. 10 and 11, it has been shown that at every place where the direction of the twill is turned, the two threads which form the junction cut with each other, or weave oppositely. This method is usually adopted when there is a normal amount of threads for the diameter of the yarn, and also in some cases where the normal quantity is exceeded. This arrangement is not quite so neat as that in which the design turns on a thread; in other words, in which two adjoining sections form a symmetrical design as exemplified in Fig. 12.

(To be continued.)

Hardness of Water.

Hardness of water is chiefly due to various salts in solution, calcium, magnesium, and iron.

Two scales of hardness are in use, viz: Wanklyn's and Clark's; the latter is more general. According to Wanklyn, distilled water has a hardness equal to 1 per cent, so that water containing 9 grains per gallon of calcium carbonate, equals 10 per cent hardness, whereas on Clark's scale it equals 9 degrees hardness, distilled water equalling zero.

One pound of calcium carbonate, or its equivalent in calcium sulfate or magnesium salts, dissolved in water, precipitates, that is destroys, about 10 lbs. of soap. 1000 gallons of water containing 35 grains of calcium and magnesium salts per gallon, would render useless at least 50 pounds of soap.

1000 gallons of water for every degree of hardness, destroys 1 pounds 7 ounces of soap.

This not only causes a loss in scouring, but is also extremely prejudicial in dyeing, unless corrected.

To find the production of a drawing frame, multiply the surface speed of the front roll per minute by 60, and divide that product by 36, the result will be the yards delivered per hour; multiply this by the weight per yard of sliver and divide by 840; this result will be the hanks per hour; or divide by 7,000 and the quotient will be pounds per hour. Multiply the pounds per hour by the number of hours run and deduct about 20 per cent for loss and the product will be the production for the time specified. To get surface speed of front roll multiply the diameter of roll by 3.1416 and multiply that product by the revolutions per minute.

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TO MEET COMPETITION

You must be equipped with the

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Can you *afford* to transfer half hose tops by *hand* in the *day-time only* when by using our

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this *Expensive Labor* may be *saved* and the machines run *24 hours*, thus more than

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WE ANNOUNCE

that we have taken over the exclu ive handling of the product of the

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makers of the METAL HOSIERY DRYING FORM known to the trade as the

"THREE-in-ONE"
METAL FORM

¶ The STANDARD MACHINE COMPANY only entered into this arrangement after mature investigation and with the certainty that this Form has features exclusively its own.

¶ As in all other products made and sold by the STANDARD MACHINE COMPANY the same guarantee that the materials used in the "Three-in-One" form and the workmanship employed in its manufacture are of the highest standard obtainable.

¶ Your confidence and investigation is asked.

¶ Literature or our personal representative sent as suits your desire.

¶ Exhibit of the Metal Form in conjunction with our Hosiery Machines at our Show Rooms.

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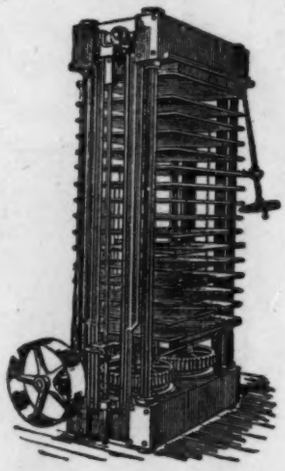

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FRANKFORD, PHILA.

Warp Loom Mechanism

BY WILLIAM DAVIS, M. A.

It is well to appreciate the difficulties which the manufacturer has to confront in introducing a new branch of trade to his knitting mill. One of these difficulties occurs in the matter of help who have been accustomed to machines of one particular class and have become skilled in their use. A new member of mill equipment does not always receive a kindly welcome at their hands and if the overseer is not particularly well disposed towards it, he contrives to place many difficulties in the way of its successful operation. The writer has seen so much of this trial and error method of introducing new branches of knit goods that he has come to the conclusion that unless the firm has at its disposal a mechanic, who has a genuine love of mechanism and will take an interest in the machine and its capabilities, the chances of success are remote.

Sometimes all manner of difficulties are put in the way by worker and overseer alike and the latter sometimes persuades the manufacturer that the new venture cannot prove successful. The manufacturer on the other hand requires the perspicuity to discern when he is being tricked by a conspiracy of this sort and should take means to ensure that the new machine will be given a thorough trial. On the part of the overseer it may be said that if he is already overburdened by a large and varied responsibility which devolves on him by virtue of the already diversified nature of the products of the firm, it is unfair to add to these rsponsibiliies without making arrangements for a mechanic to give the necessary time to mastering the details of the mechanism and learning the principles of designing and coloring. If this cannot be done, a single machine presents the aspect of the forlorn child, it is neglected and other operators take a malicious pleasure in an inability to operate it.

So many cases of failure arise from this cause, that we have come to the conclusion that it is inadvisable to install a single machine on trial, but that several should be obtained along with an overseer mechanic who has been trained to the trade. It is certainly advisable to do this for the first year, at least, so as to give the machines their best chance of successful operation, for in this time the capacity of the machines can be proved and by training new help in their working, a wholesome respect for the machines is acquired.

The writer recollects an instance where a firm was able to add a most profitable new warp loom department to its business which came about in this wise. The daughter of the proprietor had been married to a local clergyman who occasionally went down to see the knitting apparatus of their firm and in so doing became interested in the many mechanical problems connected with their successful operation. These problems so engrossed him that in a few months he was found devoting more time to the knitting industry than to the spiritual needs of his congregation. The members of his flock held a protest meeting and ordered him to send in the resignation of his charge to which he was reluctantly compelled to agree. Thus thrown on his own resources, he had no alternative but to take off his coat, roll up his shirt sleeves and devote himself henceforth to the textile side of the business. He was obliged to sell shawls, which at the time were worked out of woven fabric and at every turn he was confronted by the severe competition of the products of Chemnitz in Saxony, which province controls a monopoly of this class of trade. Being unable to sell the woven shawls in the face of the more handsome fabrics issuing from the warp loom, he decided to install some of these machines and devote himself to the mastery of the details of their construction. Being of a decidedly mechanical turn of mind he was successful in acquiring the art of running these looms and by producing new designs, and he had the immediate satisfaction of introducing an entirely new industry to the district, for his products found a ready market.

Manufacturers who contemplate taking up this branch of the business should bear these points carefully in mind and if convinced that a market can be secured for these products, the best method is to install several machines and secure the services of one who has the mechanical experience to repair defects and to keep them running, otherwise a disappointment is in store. As can be seen from the foregoing example, the warp loom product can quite successfully be taken up by the maker of woven fabrics because it is in most respects more akin to the woven fabric than to knitted texture. These looms can quite well be introduced into the equipment of a weaving mill, if it is only desired to produce webs of the fabric for sale. Like the woven cloth, these are produced in long lengths of uniform width from warps previously prepared and for some branches of the trade, the warp loom fabric is bought from a factory which specializes in producing the webs alone.

This is more particularly the case in branches where goods are produced in great bulk from one standard texture of warp loom fabric as in the case of several classes of standard gloves. The webs are worked in a factory with warp loom plant and sold at so much per yard to firms who specialize in cutting-out and making-up the articles. The procedure is thus identical with that of the makers of woven goods who sell the products of the looms in exactly the same manner. Up to this stage the trade can be assumed quite as well by the maker of woven goods who in several respects has an advantage over the knit goods manufacturer. A slight modification of his warping plant will suffice to make it suitable for the warps of the warp loom fabrics, the methods of preparing and beaming the warp are identical and can be performed by the regular staff of warpers of the firm. Further the drawers-in of the warps of woven goods can use their skill in the very similar operation of drawing the threads of warp through the guides of the warp loom. The making of chains for the guide bars and the running of the warp looms could be undertaken by one of the more intelligent of the loom overseers, whilst the art of coloring and designing the fabrics belong far more to the woven branch of textiles than to the knit goods branch. Up to this point, there can be little doubt that the maker of woven goods stands even a better chance of success in this new branch than the knit-goods manufacturer, but if we pursue

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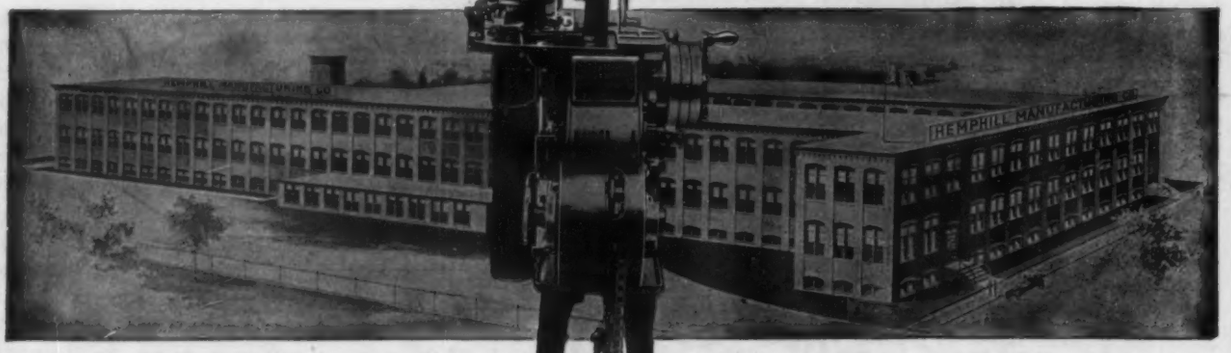

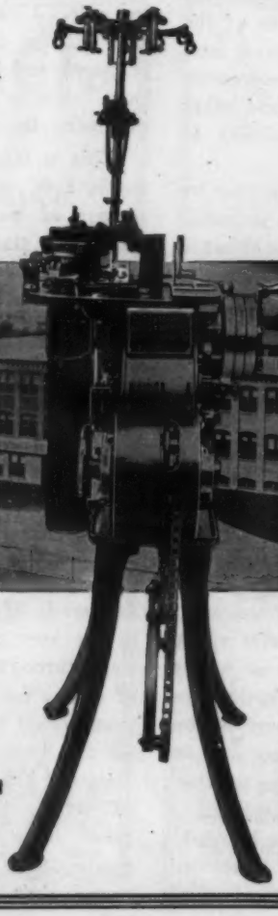

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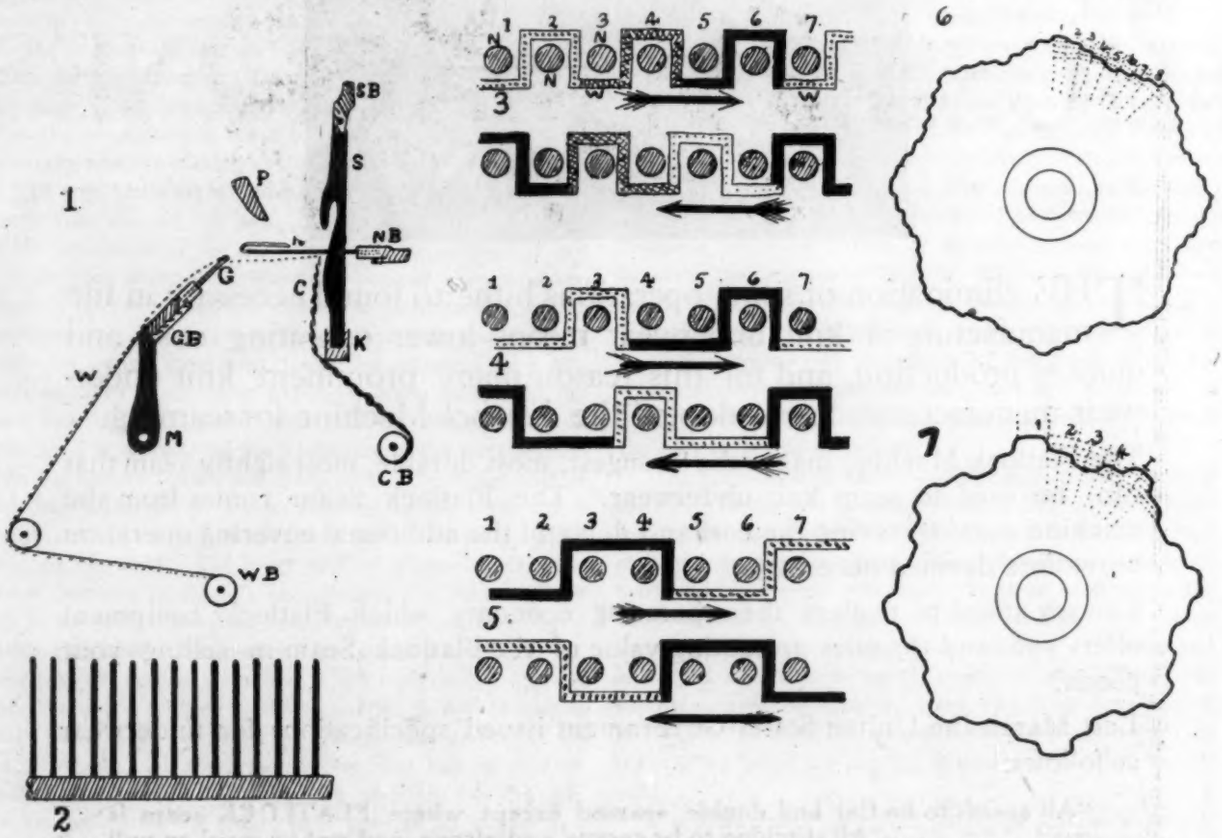
the subject a little farther it will be seen that the knit goods maker who understands the business of making up all kinds of garments ready for the market has a great advantage over the maker of woven goods in the matter of preparing a large variety of garments for the merchant.

The use of this texture is increasing for a large assortment of articles such as golf-jackets, fringes, hats and hoods; jerseys, scarves dressing jackets, surgical and millinery nets, gloves, coat linings and fleecy fabrics, and it will be recognized that for such a large variety of articles, the knit goods producer has a great advantage over the woven goods maker. From these considerations it will be evident that the ideal manager for a department of warp loom products is one who has experience which is a combination of that derived from coloring and designing woven goods and preparing these for the loom, whilst in the matter of machine adjustment and garment production the knit-



goods experience is essential. It is scarcely likely that the ideal man will be forthcoming, but it should be sought to secure one who has as many of these qualifications as possible.

INTRODUCTION TO THE MECHANISM.

An endeavor will now be made to demonstrate the fundamental principles underlying all such warp loom mechanism which if properly mastered will go a long way towards providing a reliable basis on which actual practical experience with the mechanism may be placed. To meet with success in this branch of the business in the fullest sense of the term, it is essential that the overseer should possess an enthusiasm for textile mechanism and undoubtedly he will find much in this branch which will stimulate and maintain his interest.

Some 40 years ago the foundations of the success of the warp loom fabric was laid by the workers of the hand warp loom and a large number of these machines were to be found all over the Continent of Europe and in Great Britain. From point of view of the training of the young "idea," it is a misfortune that few of these hand looms are now in existence. It would be a great advantage to have one of these hand looms in a factory for on it the learner could be initiated into the principles of mechanism and designing which are to be found more or less in all forms of this machine.

In making a study of this type, it is necessary to have clear understanding of the various stages in the formation of a course of loops and the movements are much alike in all varieties, hand and power. If an understanding is obtained of hand mechanism, transition to the power varieties is a comparatively simple matter.

In diagram 1 are shown the minimum of parts necessary to making a course of loops on the warp loom. The view is taken from the side, and the chief factors are S = the sinker, *SB* = sinker bar, *N* = the needle, *NB* = the needle bar in which the needles are fixed, *P* = the presser, *G* = the guides, *GB* = the guide bar in which the guides are fixed. The guide bar works on a fulcrum at *M*. *W* = the threads of the warp. *WB* = the beam on which the warp is wound. *C* = the cloth. *CB* = the cloth beam. *K* = bar in which the sinkers rest.

The sinkers are all fixed together in a bar *SB* so that they have a collective motion along with the bar. Their tails are fixed in *K* so that they can be controlled in their out-and-in motion from handles at each side. The guides also are duplicated along the whole width of the machine and are controlled in their motion by the guide bar *GB*. The warp as rolled onto the beam *WB* beforehand and each

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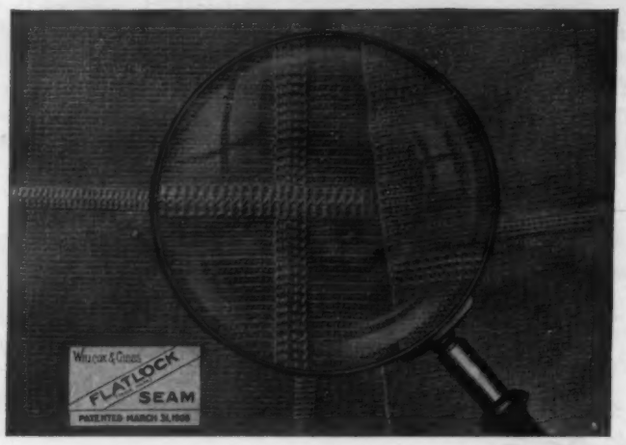

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thread is drawn through the eye in the extremity of the guide point. Although there seem to be many separate parts in this machine, the redeeming feature, from point of view of simplicity of construction, is that the sinkers individually have no motion but are moved in a body in the bar. Again although there are so many individual points with threads in each, they are all controlled from the one bar which when it moves gives an identical motion to all guides. Thus in comparing the inside of the warp loom with that of the knitting frame, the former is very much more simple, there are no slurcocks and no mechanism for laying the yarn over the needles and dividing the loops.

Diagram 2 gives a view of a section of the guide bar seen from the front of the machine and with its points lying in line with the needles of the frame. Needless to say the set of the guides in the bar must be identical with that of the needles of the frame and an exact adjustment is one of the first essentials of successful working. The points have to pass right between the spaces of the needles at each course and should the guide bar become loose or deviate from its adjustment by the merest fraction, this may be the cause of wholesale disaster at the first course. Provided that the adjustment is exact the machine works with great accuracy and astonishing swiftness.

To any who have not had experience with this class of mechanism one of the most difficult parts to understand is the movement of the guide bar with its points. It is a motion more easily comprehended when one observes a machine in operation, but it is difficult to understand a written explanation. The diagrams sketched in 3, 4, and 5 should make the subject more clear, the circles represent the needle ends enlarged many times whilst the warp threads *W* are seen crossing over, under and between the needles. In diagram 5 is represented the interlacing of the warp threads with the needles for a 2 and 2 lap over. The upper half of the diagram gives an arrow pointing to the right which indicates that the lap of the warp threads is taking place towards the right. The lower half of Figure 5 gives the arrow pointing to the left as indicating the return of the lap to the left. The thread lapping to the right is shown in black to pass under needles 1 and 2 and when the thread rises between needles 2 and 3 it is laid over needles 3 and 4 and then drops between needles 4 and 5. A similar motion takes place along the width of the machine and when all the yarns are laid, the frame proceeds to knit its stitches in the usual manner. For the next course in this example the bar containing the yarn guides reverses its motion and laps back again to the left, the black thread passes under needles 7 and 8, and over needles 5 and 6, the dotted thread similarly passes under needles 3 and 4 and over 1 and 2.

Fig. 3 illustrates a 1 and 1 lap and the yarns are made to move 3 laps to the right in succeeding courses and a similar number to the left back to the start again. The upper portion of Fig. 3 operates as follows:

Course 1 shown by the dotted thread goes under needle 1, between needles 1 and 2, over needle 2 and down again between needles 2 and 3. A similar motion takes place all along the width of needles and the threads laid, the frame completes its course of loops in the usual manner.

Course 2. The shaded thread passes under needle 3, between needles 3 and 4, lays thread over the latter and passes down between needles 4 and 5, after which the course is duly completed.

Course 3. The movement of the thread at the third successive course may be seen in the form of the black thread which passes under needle 5, between needles 5 and 6, laying its thread over the latter and passing between the needles 6 and 7, when the course is completed as usual.

In the lower part of Fig. 3 may be traced the reversal of the motion of the guide bar from right to left when it will be noted that the needles that were underlaid in the journey to the right are now overlaid and vice versa.

Figure 4 represents a 2 and 1 arrangement of lap. In the upper part of the diagram the movement towards the right is indicated by the arrow whilst the return journey is shown in the lower portion of the figure by the arrow pointing to the left. In the lap towards the right for the first course the dotted thread is seen to be laid under needles 1 and 2 when it passes upwards between needles 2 and 3 and passing over needle 3 drops between needles 3 and 4. The threads are similarly laid across the entire width of the machine and the course of loops completed in the usual manner. The second lap of the pattern is given in the upper part of diagram 4 in solid black, the thread passing under 4 and 5, between needles 5 and 6. The thread is then laid over needle 6 when the thread next passes between needles 6 and 7 to complete the lap. The movement of the same thread guide for the third course of the pattern may be traced in the under portion of diagram 4 where the arrow points in the direction of the left. The dotted thread passes to the left under needles 5 and 6, between needles 4 and 5, over needle 4 and down again between needles 3 and 4. A similar motion may be traced for this guide in the 4th course where the thread shown in black passes under needles 2 and 3 and lays its thread over needle 1 from which point the pattern begins as before.

The whole basis of understanding the formation of warp loom fabrics lies in a thorough grasp of the method of making the lap and the reader would do well to consider these explanations very carefully. The movement may be summarised in a general way thus: In their next course the warp threads are required to operate on a different needle than before and so the lap always begins with a general movement one or more needle spaces to the right or left. For elementary patterns the usual way is to move several needles to the right in successive courses, and return to the starting point by lapping several courses back to the left.

The preliminary movement under the needles is merely for the purpose of getting the guides into a position from which they will be able to lay their yarns over new needles. To perform this, the guide bar receives an upward sweeping motion between the needles. The guides now hold the threads over the needles and another sidewise motion is needed to lay the yarns over the stems of the needles after which the guide points have to pass downwards through the needles thus securely laying the threads so that the course of loops may be knitted in the usual manner. In ordinary machine knitting with the spring needle there is an operation known as sinking the loops and dividing them which involves a heavy equipment of cams etc. The sidewise motion of guide points cause the threads to be laid over and in front of the nose of the sinkers, so that the latter have only to move forward in order to pass their threads under the springs of the needles prior to the pressing operation.

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Characteristics

The characteristics of a knitting machine, like those of an individual, are determined by its origin and history; just as knowledge of the individual's family, schooling, and early life are desirable for the formation of an idea of his characteristics, so knowledge of the plant, personnel and ideals involved in the construction of the knitting machine are necessary for an understanding of its merits. Investigate the origin of our knitting machinery.

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In every lap of a thread guide there are four motions, first under the needles, then up through between them. The third stage is the lap over the needles and the final motion brings the points downwards between the needles and so completes the operation.

THE LAPPING WHEELS.

Like so many other forms of sidewise movement as performed in the knit goods industry, the movement of the guide bars in this machine is performed on the curved rim principle. This system has many advantages, they can be cut to the necessary accuracy and work very smoothly. In comparison with chain pattern devices they are rather rigid because you are required to have a complete wheel for each pattern and as the wheels have to be constructed from wood or steel with the utmost care, the production of new patterns is always attended with some difficulty. In systems such as the chain, it is possible to make a chain for each pattern and this finished, the chain can be dismantled and be prepared for a new pattern. The curved rim wheels are best for standard patterns such as are always in demand and a set of such wheels may be stocked by the manufacturer and a large and useful selection obtained from their use.

Two examples of such standard discs are given in diagrams 6 and 7. In diagram 6 the disc is cut with a design which causes the guide bar to lap to the right one needle space for 4 successive courses when the motion is reversed and the guide bar travels back again to the left four spaces in four successive courses. There are thus 8 courses in the complete pattern and the circumference of the wheel must be divided out into some multiple of this number so as to insure a complete number of repeats of the pattern being included in one revolution. In diagram 6 the circle has been divided into eight separate divisions which in turn are subdivided into eight so that the whole circumference provides for a run of 64 courses of fabric.

The method of constructing the rim of the wheel may be followed by examining the first division which is provided with dotted lines. To insure accuracy, the circle shows the other four concentric circles at equal distances apart; the distance these circles from each other is the extent of the sidewise motion of the guide bar so that this distance will be regulated according to the guage of the machine. The position of these additional four circles is shown by the dotted lines in the first division and the pattern has been traced in the solid black line which forms the circumference. The repeat of the first pattern is shown in numbers 1 to 8 which indicate the successive stages of the lap. 1 is shown on the circumference of the outer circle, 2 passes along a part of the circumference of the second circle, 3 is placed on the 3rd circle, 4 is found on the 4th circle and 5 is on the inner or 5th circle. The return of the lap to the left is now made and is evidenced by the rise to the 4th circle at 6, to the 3rd circle at 7, to the 2nd circle at 8, after which the pattern goes back to start on the outside circle which is the point from which it started.

This arrangement is continued all around the circumference of the disc and provides for 8 complete repeats of the pattern. The size of the disc of course is a matter of convenience, if it is too large it becomes unwieldy and tends to be unsteady in its motion, on the other hand a small wheel is difficult to construct from a mechanical point of view. One defect of this method of concentric circles for this type of disc should here be pointed out for as we approach the centre, the concentric circles become less and on taking a division of the inner circles as the measure of the lap, this is shorter than the laps sketched on the outer circle, the lap becoming shorter as we proceed towards the centre of the orginal circle. Obviously all the laps must be of exactly the same length and the engineer in making a wheel for practical requirements has to make adjustments to ensure that all laps are identical in length.

Diagram 7 gives a view of a wheel which in a coarse gauge would act as a medium of the famous 1 and 1 lap which is the minimum lap possible to obtain in a warp loom if the characteristic structure has to be maintained. The wheel used for a gauge twice as fine is an example of the 2 and 2 lap as illustrated and described in connection with diagram 5. In this example there are again 4 concentric circles added and the dotted portion will show that the laps take place in two's. One repeat of the pattern occupies 8 needles and in the first division these are marked 1 to 4. The part marked 1 is on the outer circle and in passing to division 2 the line falls through two divisions which will cause the guide bar to move to the right the distance of two needle spaces. Similarly the fall from the 2nd to the 3rd division takes place through the distance of two spaces. At this point the pattern reverses its direction and division 4 shows a step up of two needle spaces, a similar step taking place from 4 to the start of the pattern.

In a coarses gauge this wheel could be used for the 1 and 1 pattern where the successive laps would only extend over one needle at once. With the patterns exemplified in two diagrams, some good standard ground fabrics may be produced, but if the full advantage has to be secured of the figuring capacity of the machine, more than one guide bar has to be used and with each guide bar a separate pattern disc is required. The patterns mentioned would be very acceptable as a groundwork, but if it were desired to embellish this, one or more separate guide bars would be required and in each their own warp yarns would require to be placed. If we examine the many fancy fabrics produced on this machine it is surprising what an effective result is secured from a very limited use of fancy yarns; by the extra guide bar these fancy yarns can be placed on the surface of the fabric so as to "meet the eye".

Arizona Egyptian Cotton.

The necessity for clean picking and proper storage, ginning, and baling of Arizona Egyptian cotton is emphasized particularly in Bulletin 311, "The Handling and Marketing of the Arizona Egyptian Cotton of the Salt River Valley", issued by the United States Department of Agriculture. The investigator also discusses the advisability of gin compression and deals in detail with advantages of marketing properly graded cotton, in connection with which the author discusses the classing of this cotton and its staple length.

The nature of the Egyptian cotton boll makes clean picking more difficult than in the case of ordinary upland cotton, yet because its long silky fibers are to be used in the manufacture of fine combed yarns and mercerized goods, it is essential that it be picked free of leaf and hulls.

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ZAVON is a solvent for the textile industry. It can be used on all kinds of animal and vegetable fibre with absolutely no injurious effect on the fibre or the receptacle in which it is used.

The knit goods trade particularly are constantly troubled with oil spots, dirt and graphite, some mills getting as high as 30% spots in hosiery, while the underwear manufacturer is almost as badly off.

Soap will remove light vegetable oils, but is not satisfactory for the mineral oils and is worse than useless on graphite.

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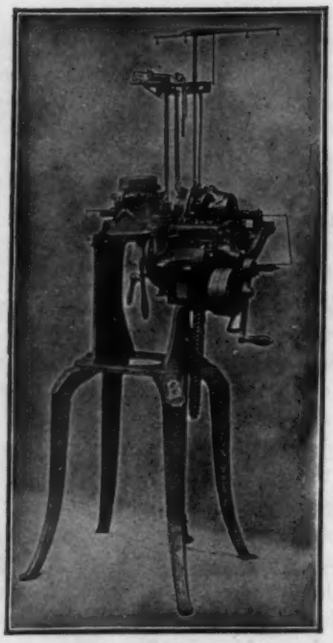

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So simple that an unskilled operator can learn to run it in a day.

The Boss Knitter means more production for the money than any other machine. Investigate.

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The roller gin does not clean the foreign matter from the seed cotton as some saw gins do, hence the necessity for clean picking by hand.

At first there was a tendency on the part of pickers to gather the cotton rapidly, making a very large wage at the expense of the grade of the cotton. The farmer is beginning to realize, however, that the price and quick sale of cotton depend largely on the grade, which means that he must insist upon his cotton being picked clean. As a whole the picking in the valley in recent crops was very fair, but the bulletin shows that by careful and clean picking the greater portion of the crop apparently can be made to grade Choice and above.

Egyptian cotton if not properly stored is specially subject to damage by heat, heavy dews, and rain. Damp or wet cotton does not gin smoothly, but produces a curly and matted condition of the fiber, which lowers its grade and value. At certain periods some of the cotton was so damp when ginned that the friction of the rollers against the knife-edge heated the cotton greatly.

Where no warehouse is available the baled cotton, the investigator recommends, should be removed from the gin platform to a cotton platform. Any cotton that cannot be stored on this platform should be arranged in the yard on dunnage, which is formed by skids or stringers, to raise the bales at least 4 inches above the ground. This is high enough to allow free circulation of air under the bales and thus prevent country damage. The bales should be turned over at intervals in order to allow the under side to dry, as, in spite of the dunnage, it is liable to absorb a certain amount of moisture. Bales allowed to stand with the heads of the bales on the ground, showed damage which ranged from 1 to 7 pounds per bale.

The bulletin points out the difficulties of marketing and handling bales that are damaged in one spot, and the loss that comes from this source. It also emphasizes the importance of having every gin use a good quality of new bagging or a heavy burlap of sufficient strength to withstand rough handling.

The use of a gin compress in handling the Arizona crop would, in the opinion of the writer, bring about a great improvement in the existing methods of marketing the cotton. While the roller gin does not adapt itself to feeding into the roller feeder type of press, the author believes that a gin compress without the roller would be as well adapted to pressing cotton from a roller gin as from a saw gin. The gin-compressed bale is easier to handle and takes up less space, as the cotton is usually pressed to a density of 30 pounds per cubic foot. This permits 100 bales, which constitute a unit sale and shipment, to be loaded into a standard freight car 36 feet long whereas only 40 bales of flat or uncompressed cotton can be loaded into a car of the same size. Cotton put up by a gin compress can be shipped by railroads to ship side at the compressed rate and the steamship companies, if requested, will make a better rate on cotton of 30 pounds density than on the old-style bale. Gin compression also has an advantage in that the bagging remains uncut and the farmer who grows a particularly good quality or variety of cotton could keep his identifying mark on every bale.

He is truly wise who gains his wisdom at the expense of others.

The Knit Goods Market.

The production of hosiery is believed by some manufacturers to have about caught up with consumption. The good effect of this, it is held by the same authorities, will be felt only in improved deliveries, and not in any lessening of price. On the other hand, the price tendency continues upward, and some new high figures were named in the last week or two.

Many manufacturers still are going over their costs for for last year, after completing their inventories for the twelve months in preparation for reporting the sums for which they will be liable in excess profits taxes. Some are known to have made the discovery that profits are considerably under what it was supposed they would be in view of the high prices, and there is an impression that after manufacturers generally have had time to properly compare figures there will be price revisions on a number of lines.

A Pennsylvania manufacture has ascertained that his overhead costs for 1917 were approximately three times as high as in 1914, amounting to an increase of 13½ cents per dozen—from 6½ cents in 1914 to 20 cents in 1917. How he reaches this conclusion is shown in the following, taken from his cost sheets for the years in question:

1914. Maximum production 900 dozens. Wages $9000. Water rent, $600. Coal, $1900. Taxes, $320. Miscellaneous expense in cost of manufacture, $5200.

1917. Maximum production 1400 dozens; output 900 dozens. Wages, $34,000. Water rent, $900. Coal, $7500. Taxes, $588. Miscellaneous expense in cost of manufacture, $9700.

The total overhead was $17,020 for 1914, against $52,685 for 1917, with practically no variation in production.

The disclosures in this one mill probably are but a duplicate of what has been revealed in every mill where appraisal sheets have been studied and comparisons made, and contribute to the deduction that hosiery manufactured this year will have to sell at higher prices than the production of last year.

The shut-down order of National Fuel Administrator Garfield has not improved the outlook from the standpoint of the general consumer. A single illustration may suffice: One Philadelphia manufacturer, having an output of 3000 dozen pairs per day, will have 45,000 dozens less for his customers as a result of the shut-down for a total of fifteen days. Multiply the one-half of this by say 750 mills and we have the minimum loss of production. At this rate, granting that production is abreast of consumption, it is a question of only a short time when the situation must be reversed. And necessarily the fifteen days of idleness must add to the overhead cost, so that, figure as one will, there can be but one conclusion—prices must advance to compensate for losses incurred by reason of the enforced shut-down.

If the appeal from Washington to employers that they pay their employees regular wages during the periods of idleness were heeded, the cost of hosiery to the consumer would be still greater. Department stores, it is stated, will pay their sales forces for the idle days, as though they had been employed. This they can do without material loss, for what was not sold one day remains to be sold on another, so that there should be but a slight falling off in the volume of the stores' business. Furthermore, if the stores cut out

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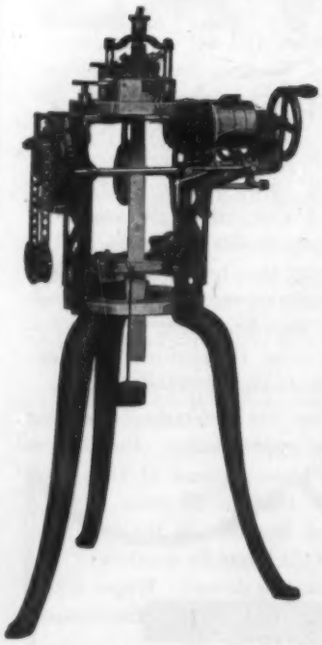

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but one "bargain day" per week during the operations of Administrator Garfield's order, or add a small per cent to the selling prices of novelties, which always are taken, regardless of conditions, they would be recompensed for such wage payments.

In the mill it is another matter. Every day's production lost is like the water that has gone over the dam—it has gone for all time. Labor laws preclude the possibility of operating extra time for making up for lost time. So far as can be ascertained, knit goods manufacturers will not pay employees, other than those on fixed salaries, for the time in which Administrator Garfield said they should not earn. Were the larger employers to do so, they could ruin their small competitors, and the effect would be higher costs of operation than are entailed by a simple observance of the non-fuel consumption order.

Conditions were bad enough before the order for idleness was issued, as was gathered at the recent meeting of the Jobbers' Association of Knit Goods Buyers. In all the addresses and discussions it was freely admitted that stocks were low and production curtailed, and still more perplexities for manufacturer and distributor were predicted.

Jobbers made some complaint of the fact that they are required to take in Fall merchandise earlier than is customary and that mills exact shorter terms. An effort was made to create sentiment in favor of shorter terms to retailers. It was pointed out, however, that the latter then probably would accept no deliveries until they had need for the goods, and that therefore the jobber would have to carry them. To meet this, it was suggested that higher prices be named for deferred deliveries. In any event, considerably more money will be required for financing this year's business than was necessary last year, and here again merchandising costs are increased, to the dismay of the consumer.

Government requirements of knit goods for the year are pretty well established, according to Lincoln Cromwell, former head of the knit goods committee of the Council of National Defense, and recently appointed knit goods advisor on the staff of the quartermaster general. Manufacturers therefore are in position for determining what their output for civilian needs may be, unless there should come further shut-down orders or other regulations interfering with operation. While the quantities to be purchased by the government may be known, most of the goods still are to be manufactured. Roughly, purchases to date are about 77,000,000 pieces of underwear, 80,000,000 pairs of stockings and 10,000,000 pairs of knitted gloves.

Conditions at the outstart of the year augured for a brisk trade for the next twelve months, notably in most lines of hosiery. Some interests have been trying to make much of the fact that production is in excess of shipping facilities, and affected to believe prices must suffer some temporary disturbance. This situation would be felt locally only, if at all, and any tendency in this direction is more than offset by the scarcity of some articles, inordinate demand and prospective advances. Cotton goods have not been moving up in proportion as yarn and labor costs have increased, partly because, as a broad proposition, the market has been quiet as a holiday aftermath, and eventually should feel the stimulus of the strong position of cotton.

Manufacturers taking note of embargoes and freight congestion are urging jobbers to have their Fall samples forwarded by express, lest they be delayed in going to their trade. A Middle West underwear mill is having yarn in car lots forwarded by express, and even then from six to ten days are consumed in transit. There is grave fear that much Spring merchandise will not reach distributors in advance of the time that it should be in the hands of retailers.

Unsettled transportation conditions, coupled with apprehension of a shortage of hosiery as the year advances, is working toward a big spot delivery business of year-around goods. Some merchants regard it advisable to take in staple lines in reasonable quantity to be carried over until Fall, at the same time providing against delayed deliveries of stuff for Spring and Summer.

Fear of a further scarcity of cotton hosiery is predicated to some extent on the knowledge that there will be practically no woolen hosiery for civilian trade. The Rockford (Ill.) Mitten and Hosiery Company has been advised by Government authorities that about its entire production for 1918 will be required for military uses, and that it might be well to make no important commitments for deliveries to regular customers. One mill has on its books Government contracts for 8,000,000 pairs of woolen hosiery. This is by no means 50 per cent of what the Government will take.

The situation, from the standpoint of the civilian, was not improved by President Wilson's message to Congress defining the country's war aims. The President's utterances are taken to mean that Government needs will be even greater than was contemplated in the trade. At least one important hosiery manufacturer, acting on official intimations, has changed the cylinders on his knitting machines, adapting the mill to 84 needle socks, selling now at $1.50 for two pound goods, and not being pushed at that.

Underwear supplies will be similarly affected, so far as heavy weights are concerned, and duplicate business should show material advances. Buying for Fall is well out of the way; mills generally are comfortably sold up, and it would seem that when it comes to filling in, mills will virtually write the orders. Renewed buying of summer underwear is expected in a week or two. A commission house with men on the road in the South is receiving substantial business, notably from Texas. While there have been no price advances in heavy underwear since the opening, neither have there been any recessions, manufacturers standing pat.

Opening of cotton hosiery lines for Fall is about due; but samples will be shown in only a small way for some weeks. Charles Chipman Sons Company opened its fleeced and a few cotton lines early in January. The Cannon Mills opened fleeces some days ago, prices showing advances of 30 to 35 per cent over last season. The Cannon does not expect to name prices on cotton hosiery before the middle of February. With business necessarily slow for January-February delivery, there is some question of the advisability of showing lines at this time for Fall. Jobbers who buy fleeces now, probably will enjoy the advantage of a substantial rise in price in advance of delivery. It is freely predicted that there will be a jump of at least 15 per cent by the time the goods reach the retailer.

Notably scarce articles in cotton hosiery are half hose, infants' rib leg and children's ribs. As to cashmere socks, several large houses have buyers located in New York for the time, prepared to take everything available. It is not uncommon to receive a wire from a jobber in some dis-

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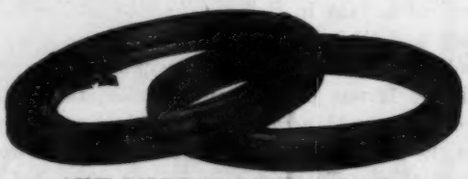

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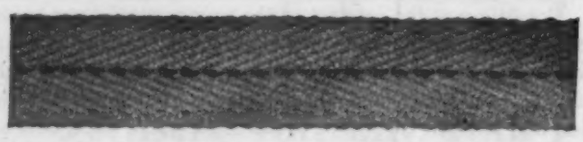

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SPINDLE TAPES and BANDS

tant city: "Cover for our usual quantity; could take more." Buyers practically have been reduced to beggary.

Ladies 220 needle mercerized in high colors are in strong demand, commanding as an average $2.75, sales being made at $3 and as low as $2.50, the variations being due mainly to finish and mill attitude. Mercerized in black and white are in about the same position as for the last few months.

Watchful factors are looking for keener interest in mercerized lines, from the fact that the Government is a heavy buyer of mercerized yarns for cloth for the American fleet of aeroplanes. Two Eastern mills alone have contracts aggregating 75,000 yards of cloth from mercerized 60's 2-ply. This is understood to be but a fraction of the Government needs of cloth of this character.

Commission houses are specially interested in half hose —144 and 176 needle. A Southern mill selling to jobbers direct is putting out a line with automatic top, from 18's carded yarn, at and around $1.30, f. o. b. mill, 2-10, 30 days net—this for looped toe. Sales of 176 needle looped toe, hem top, are reported to have been made at $1.25 by a jobber, who is regarded as willing to sell under mill prices in the hope of getting a temporary buying advantage. A Broadway commission house is getting $1.40 for 188 needle half hose, and $1.45-$1.50 for ladies' 176 needle carded, 26 ounce. A Leonard street commission house finds a good market for 144 needle sewed toe 16 ounce sock at $1.20-$1.25.

A mill agent reports his mill authorizing him to sell ladies' 176 needle carded 20's at $1.25. This agent is in the market for cotton lines for his own account, and may be suspected of quoting his selling price on a basis of what he might be willing to pay.

A Pennsylvania mill is getting $3.25 a dozen for a high-finish line of misses ribbed goods, rise and fall 10 cents, and expects to advance shortly to $3.50, for Fall delivery. Another manufacturer is finding a ready market for 240 needle mercerized half hose at $2.60. Mill agents agree that the price is low; that the stocking would command $2.75 to $2.87½.

Half hose with the knitted on top are attracting considerable attention, prices for these lines ranging from $1.20 to $1.35 a dozen for 16 to 19 ounces.

What is regarded a low price is named by a mill for 26 ounce half hose. The same mill is quoting $1.75 for 176 needle ladies cotton hose, two pounds.

A Pennsylvania mill reports selling a line of high-finish ladies' 220 needle, combed peeler 34's single at $2.25, which is 25 to 35 cents above quotations of some agents for a similar grade, regular finish. A seller of a like line of combed peeler 36's single, let a quantity go at $1.90, which, he admits, was too little. This agent is in the market for 176 needle half hose, presumably for a mill.

The eagerness of the trade for 176 needle half hose is indicated in the interest that was shown in a short length sock which was offered by a Southern mill which was feeling out the market as to price. This sock, with sewed on top, probably would be accepted for export to Scandinavian countries, and in regular length would command $1.10, which is about 20 cents under what some lines of 176 are commanding for domestic trade.

One bad accident costs more than a good lighting system.

Loyalty.

Loyalty in a man is one of his most essential characteristics. Without it he is without power to do work of the kind which counts. Let it be loyalty to a principle, loyalty to his employer, loyalty to a sect; just so it is loyalty to some constant thing or person it will serve its purpose.

There is nothing by which we may judge better a man's character than by his ability to remain loyal to one given thing. Strength of character, determination, integrity, all of these are indicated in a man by the degree of his loyalty. Find a man who is loyal to an animal, a person, a belief, and you will have found a man worth while—a man in whom there is good, even though a careless world may never have discovered it.

Loyalty has kept men at their tasks through countless ages. It is the beacon light that guides storm-tossed, temptation-racked human vessels over life's rough sea, twinkling ever just over the bow and offering a constant hope to the mariner.

Give me the man who is loyal and you can have the man who is rich—perhaps he was born so. Yes, and you can have the man who is called the Big Man of the world —do you know how many souls have been trampled under his feet in his wild rush glory-ward?

But the man who is loyal—he'll be with you when you're up and he'll be with you when you're down, because he has in him that which is infinitely finer than wealth or great glory. He has in him an appreciation of the finer things of life—a regard for his fellow-humans.—*Gas Age.*

Among the Knitting Mills.

A branch plant of the Winsted Hosiery Mills of Winsted, Conn. was started on November 14th, at Norfolk, Conn., on the manufacture of 160 needle plated worsted half hose. Since that time this mill has been somewhat increased in size and at the present time is operating successfully.

The Henshaw Hosiery Mills of Oxford, N. C. has been established by Henry M. Shaw of that city and the equipment of machinery necessary for the manufacture of half hose ordered.

The Hermitage Knitting Mills of Nashville, Tenn., mention of which was made in these columns some time ago, has become incorporated with a capital stock of $55,000. Geo. H. Booth, E. H. Booth and Edgar M. Foster are among those interested.

The North State Knitting Mills of Durham, N. C. has let a contract for the enlargement of their plant and work has already begun. The floor space of the plant will be three times its present capacity when completed, which will give room for a large increase in the amount of knitting machinery employed.

The Kincaid Knitting Mills of Griffin, Ga. has been organized and application made for its incorporation with a capital stock of $200,000 by W. J. Kincaid, J. M. Thomas, and others. The plant, plans for which are being prepared by W. H. Sears, will manufacture hosiery, and Bert Elliott of Chattanooga, Tenn. will be superintendent.

The National Hosiery Mills of New Orleans, La. is to erect two additional buildings, one 90 x 60 feet and the other 40 x 40 feet. This concern manufactures hosiery.

The Adams Hosiery Mill at Taylorsville, N. C. has been

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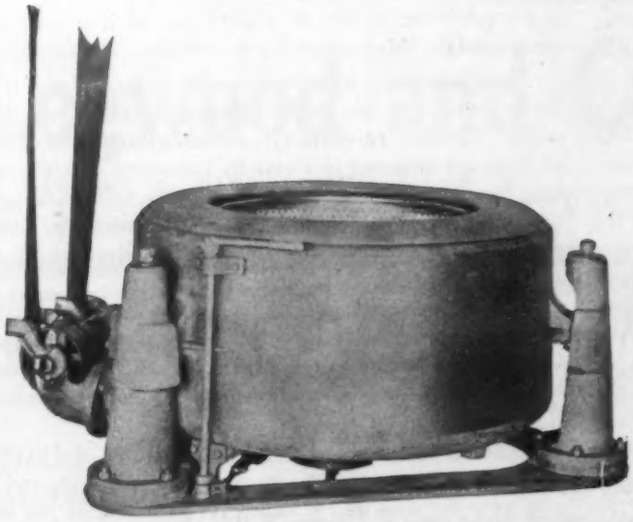

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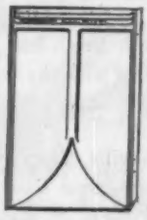

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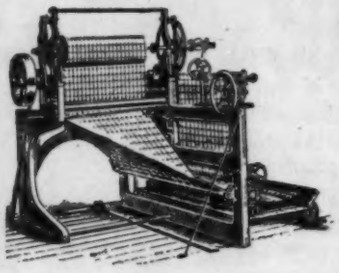

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organized with R. A. Adams as president and A. L. Adams as manager. This company manufactures womens' hosiery.

The plant of the Douglas Hosiery Mills at Douglasville, Ga., anticipates beginning operation early in February. The factory building is of brick 100 x 100 feet and the installation consists of 135 knitting machines with accompanying equipment. The plant is steam operated. J. T. Duncan is the president and treasurer.

The National Finishing Works of Burlington, N. C. is approaching completion and will have a daily capacity of 30,000 dozen pairs of hose it is said. The building is of mill construction and equipped with 35,000 square feet of floor space and two 100 horsepower boilers. Also the necessary dyeing and finishing machinery.

The Jersey Knit Wear Corporation, Masoher Street and Allegheny Avenue, Philadelphia, Pa., specializing in the manufacture of jersey sweaters, is planning to increase its present capacity and has secured additional space for this purpose. New machinery is now being installed, and it is expected to inaugurate operations at an early date.

The Elliss Hosiery Company, Philadelphia, Pa., is planning for the early establishment of a new branch factory in Danville, N. Y., and all arrangements have been completed. The company has commenced the installation of about 100 knitting machines in a factory building recently acquired, and will inaugurate operations in the near future. J. Allen Crews is general superintendent for the Danville branch.

A portion of the plant of the Driscoll & Staudt Hosiery Company, Reading, Pa., was damaged by water recently, due to the bursting of water pipes in the adjoining building. The loss is estimated to be approximately $19,000.

King, Hillman & Gill, Inc., Philadelphia, Pa., have been incorporated with a capital of $75,000 to engage in the manufacture of cotton goods. Horace P. Deacon is the principal incorporator.

The Potter Textile Company, 456 Fourth Avenue, New York, manufacturer of cotton goods, has filed notice of an increase in its capitalization from $110,015 to $180,015, to provide for expansion.

The new hosiery mill of the D. S. & W. Hosiery Company, 1120 Moss Street, Reading, Pa., is rapidly nearing completion, and the company is rushing construction work. The plant is estimated to cost $25,000. W. A. Sharp, 22 North Fifth Street, Reading, is the contractor.

The Comfort Knitting Company, Johnstown, N. Y., has been incorporated with a capital of $10,000 to operate a local plant for the manufacture of knit goods. F. G. Troutwine, C. L. Troutwine, and C. F. Ganson, Johnstown, are the incorporators.

The Newmanstown Hosiery Company, Newmanstown, Pa., has filed articles of incorporation with a capital of $15,000 to engage in the manufacture of hosiery. E. D. Rubright is the principal incorporator.

The S. and B. Knitting Mills, New York, has been incorporated with a capital of $40,000 to engage in the manufacture of knit goods. M. Schwer, S. Ahrensberg, and M. Blum, 1395 Bristow Street, Bronx, are the incorporators.

The Board of Trade of Tampa, Fla., has received a letter from the Glenn Hosiery Mills, Mobile, Ala., requesting that the citizens of the former city raise $25,000 towards the establishment of a branch hosiery mill there. It was further stated that a large number of women would be employed and that the Glenn Company, although less than a year old, had orders for four or five times as much hosiery as it could fill.

The Walker Hosiery Mills Co. of Burlington, N. C. is planning to erect a new 100 x 175 foot mill, one story high, and install therein 50 knitting machines. R. K. Lesley is the president and C. A. Walker the treasurer of the company.

Hosiery Form Sales Agents.

The exclusive handling of the product of the Philadelphia Metal Drying Form Co., manufacturing the well-known "Three-In-One" adjustable metal hosiery form, has been taken over by the Standard Machine Co., Philadelphia, and will be sold by them in conjunction with their hosiery knitting machines. The two companies will maintain their separate identities, but the Standard Machine Co. will act as the selling agent for the metal forms. Jacob Bauer, the general manager of the Standard Machine Co., is the president of the Metal Form Co., while Charles Schoneman, the Standard's representative in the Southern, Western and Pennsylvania state territories is also interested in the project.

This step was taken after long and thorough investigation, both of the equipment as well as the market for it. The Standard Machine Co. recognized the growing demand for metal forms in drying and shaping hosiery, and felt confident that it is the most advanced method because of the increased production possible as well as the important labor saving item together with the scarcity of labor at high wages. This was proven by actual mill working conditions.

The "Three-In-One Adjustable Metal Hosiery Form," it will be remembered, offers the patented feature of a changeable toe for three different sizs on the one form. Another advantage is that the manufacturer can have the shapes in boards best adapted to his needs exactly duplicated in the "Three-In-One" forms.

The Standard Machine Co. also secured the services of some of the best heating engineering experts to examine and pass upon the heating system employed in these forms. As a result of their efforts an improved patented two pipe system has been adopted, whereby the condensation of the steam has been reduced to a minimum, thus effecting an immense saving in fuel. At the same time the style of the table has been greatly improved.

It was after this thorough investigation the Standard Machine Co. decided it was willing to place their reputation of 27 years' standing behind this product as a guarantee of its merits. This fact will naturally create a confidence in the equipment because of their reputation with the knitting trade generally. They also offer the forms for sale with a full three years' mechanical guarantee.

Mr. Bauer will continue as the general manager of the Standard Machine Co., in addition to his activities as president in the new project, while Mr. Schoneman will continue to represent the Standard Machine Co. in his usual territory. Both of these gentlemen are widely and favorably known among knitting manufacturers, and their reputation should go far towards developing the "Three-In-One Metal Hosiery Form" with marked success.

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